SL-2410/2415
RMT-316

SERVICE MANUAL

US Model
SL-2410
SL-2415

Canadian Model
SL-2410

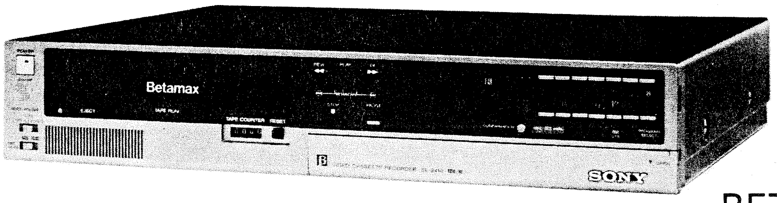


Photo : SL-2410

BETA III/II RECORD
BETA III/II/I PLAYBACK
711B CHASSIS

August, 1983

Refer to separate adjustment manual, part number 9-972-257-81.

SPECIFICATIONS

System

Video recording system	Rotary two-head helical scanning
Video signal	EIA standards, NTSC color
Channel coverage	VHF channels 2 - 13 UHF channels 14 - 83 CATV mid-band channels A-2, A-1, A—I super-band channels J—W
VHF output signal	Channel 3 or 4 (selectable) 75 ohms, unbalanced
Antenna	75-ohm external antenna terminal for VHF 300-ohm external antenna terminals for UHF

Video

Input	VIDEO IN : phono-type connector 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Output	VIDEO OUT : phono-type connector 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Signal-to-noise ratio	Better than 45 dB

Audio

Input	AUDIO IN : phono-type connector more than 47 k ohms, −10 dBs (0 dBs = 0.775 V rms) MIC : mini jack −60 dBs, suitable for microphone with 600-ohm impedance
Output	AUDIO OUT : phono-type connector Less than 10 k ohms, −10 dBs (100 k ohms load), unbalanced
Frequency response	βII : 50 - 12,000 Hz βIII : 50 - 9,000 Hz
Signal-to-noise ratio	Better than 40 dB

Tape transport

Tape speed	βI : 4.0 cm/sec. (playback only) βII : 2.0 cm/sec. βIII : 1.33 cm/sec.
Maximum recording time	βII : 3 hours 20 min. βIII : 5 hours (with Sony L-830 cassette)
Fast forward time	Under 4 min. (L-500)
Rewind time	Under 4 min. (L-500)

Timer

Clock	Synchronized with the power frequency
Time indication	12-hour cycle
Timer setting	Only for recording 4 events/3 weeks max.

General

Power requirements	120 V ac ±10%, 60 Hz ±0.5%
Power consumption	45 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	−20°C to +65°C (−4°F to +149°F)
Dimensions	Approx. 430 × 80 × 385 mm (w/h/d) (17 × 3 1/4 × 15 1/4 inches) incl. projecting parts and controls
Weight	Approx. 9.6 kg (21 lb 3 oz)

— Continued on next page —

MICROFILM

Beta
β VIDEOCASSETTE RECORDER
SONY®

Consumer
VIDEO

Accessories supplied

Betamax video cassette tape (1)

EAC-25 external antenna connector (300-ohm to 75-ohm matching transformer) (1)

75-ohm coaxial cable with F-type connectors 2 m (6 feet) long (1)

300-ohm twin lead 2 m (6 feet) long (1)

Remote Commander RMT-316 with two size AA batteries (1)

Channel indicating segments (1 set)

Optional accessories

Betamax video cassette tape L-250, L-500, L-750, L-830, etc.

Video head cleaning cassette L-25CL

Color video camera HVC-2000, HVC-2200, HVC-2400, HVC-2500, HVC-2800

AC adaptor for the camera HVA-220

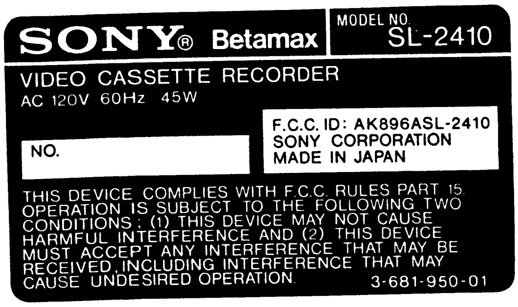
Cassette auto changer AG-500

Design and specifications subject to change without notice.

MODEL IDENTIFICATION

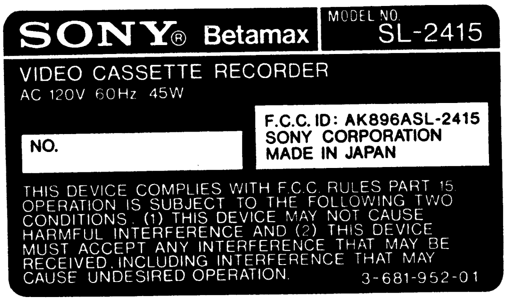
— Specification Label —

SL-2410 US Model



SONY® Betamax
MODEL NO. SL-2410
VIDEO CASSETTE RECORDER
AC 120V 60Hz 45W
NO.
F.C.C. ID: AK896ASL-2410
SONY CORPORATION
MADE IN JAPAN
THIS DEVICE COMPLIES WITH F.C.C. RULES PART 15. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS : (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE THAT MAY BE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.
3-681-950-01

SL-2415 US Model



SONY® Betamax
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VIDEO CASSETTE RECORDER
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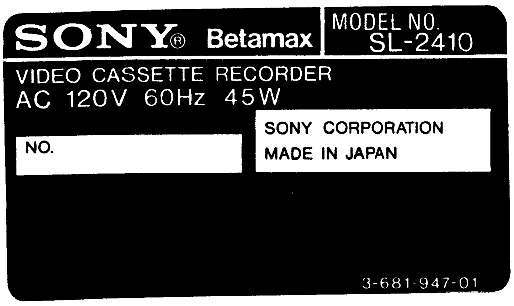
3-681-952-01

SL-2410 Canadian Model



SONY® Betamax
MODEL NO. SL-2410
VIDEO CASSETTE RECORDER
AC 120V 60Hz 45W
NO.
SONY CORPORATION
MADE IN JAPAN
3-681-947-01

* * *

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION AU COMPOSANT AYANT RAPPORT
À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UN TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT SONT IDENTIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

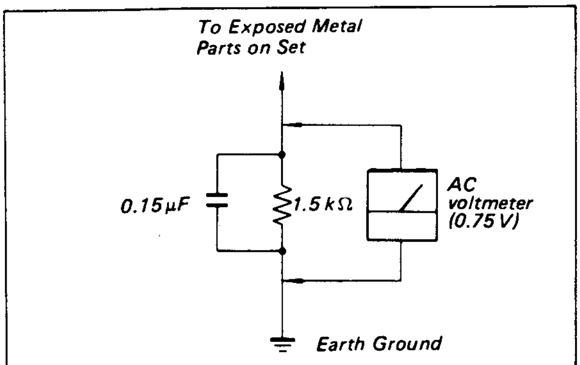


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

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REMOTE COMMANDER RMT-316 145

SECTION 1
GENERAL

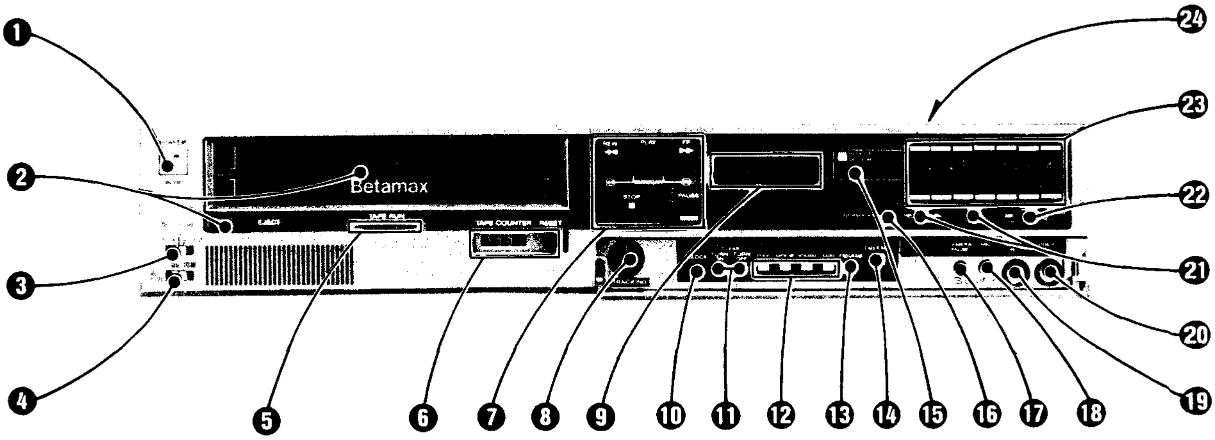
1-1. FEATURE

- Slim, easy-to-handle videocassette recorder, with a thickness of 8 cm
- Front loading
  Can be set at any place.
- Automatic rewind
  Automatically rewound at tape end in the REC and PB modes.
- Batascan/Bata SkipScan
  Can be quickly picture-searched during PB, FF and REW.
- Can be operated using a wireless remote controller.
- When the unit enters the REC mode with the broken safety tab of a cassette, the cassette is automatically unloaded.
- Automatic cassette change
  By using the optional Sony AG-500 cassette auto changer, up to four cassettes can be recorded, playback or rewound automatically.
- This video cassette recorder receives 107 channels including 25 CATV channels A-2, A-1 and A through W.
- The built-in timer permits automatic recording of up to 4 preselected programs even when you are not at home.
- The built-in clock will make a "Cuckoo" sound on the hour.
- CONFIRMATION button
  Each time you press, the turn-on and turn-off time of your settings will be announced. Your timer setting with the earlier turn-on time will be announced first.

TABLE OF ANNOUNCEMENTS

Announcement you hear	**when...**
Beep. No cassette is inside.	You have pressed the RECORD or TIMER REC button when a cassette is not inserted.
Beep. The safety tab on the cassette is missing.	You have pressed the RECORD or TIMER REC button when the inserted cassette does not have its safety tab.
Beep. Programs **A** and **B*** overlap. (* whichever programs that overlap)	You have pressed the TIMER REC button when the presettings of your timer-activated recordings overlap.
Beep. Timer set-up is incomplete.	You have pressed TIMER REC button when the timer is not preset completely.
Beep. The machine is in the timer-record mode.	You have pressed POWER button when the TIMER REC button is depressed.
Ding, dong. Timer set-up is complete.	You have pressed the TIMER REC button after presetting the timer.
Ding, dong. First* timer set-up is for Monday* of this week,* on-time 2:30 a.m.*, off-time 3:35 a.m.* See flashing channel. * They will be announced all according to the week, day and time of your presettings.	You have pressed the CONFIRMATION button after setting the timer.
Ding, dong. Timer-recording has started.	A timer-activated recording has begun.
Ding, dong. Timer-recording has ended.	A timer-activated recording has ended.
Cuckoo, cuckoo.	On the hour.

1-2. LOCATION AND FUNCTION OF CONTROLS



❶ POWER switch and lamp
Press to turn the power on. The lamp lights up.
To turn the unit off, press the switch again.
The timer section will continue to operate and the time will be displayed even if the power switch is off, as long as the ac power cord is plugged into a working outlet.

❷ Cassette compartment and ≜ EJECT button
After turning on the recorder, insert a cassette to be recorded or played back. To remove the cassette, press the ≜ EJECT button.

❸ VOICE VOLUME selector
Adjust the volume of the announcements with this selector.
LOUD : For loud announcements.
SOFT : For quiet announcements.
OFF : For cutting off announcements.

❹ RECORD MODE selector
Select either βII or βIII to set the recording speed. In playback, βI, βII or βIII mode is automatically selected.

❺ TAPE RUN indicator
Indicates the tape movement of the running tape.

❻ TAPE COUNTER and RESET button
The TAPE COUNTER provides a numerical reference point while recording, which can be used to index a recorded cassette.
To reset the counter to zero, press the RESET button.

❼ Function buttons
Control tape transport. See page 15.

❽ TRACKING control
The center detent position provides the correct tracking for the cassettes recorded on this recorder.
If streaks or snow appear in the playback of a cassette which has been recorded on another video cassette recorder, turn this knob to obtain the best possible picture.

❾ Time display window
Normally the actual time is displayed here. While the timer is being set, the setting time and day are displayed.

❿ CLOCK button
Use this button in present time setting.

⓫ TURN ON/OFF buttons
Use these buttons in turn-on or turn-off time setting.

⓬ DAY, HOUR, 10 MIN, MIN buttons
Use these buttons in turn-on day and time or turn-off time settings while pressing the TURN ON or OFF button.

⓭ PROGRAM button
Press to select a program position A, B, C or D to be programed.

⓮ TIMER REC button
Press for timer-activated recording. While the timer is in operation, "TIMER REC" indication will light in the display window.

⓯ REMOTE SENSOR
Detects the infrared transmitting signal from the supplied Remote Commander RMT-316.

⓰ CONFIRMATION button
Each press on this button informs you of a timer recording setting, starting from the program that turns on the earliest.

⓱ CAMERA PAUSE jack (special mini type)
To start or stop the tape on the camera, connect the Sony HVA-220 ac adaptor to this jack.

⓲ MIC (microphone) jack (mini type)
Connect a microphone or the MIC OUT plug of the ac adaptor here for audio recording. When a microphone is connected, neither the sound from the AUDIO IN jack nor the sound of a TV program can be recorded.

⓳ AUDIO IN jack (phono type)
This jack accepts audio signals. Connect it to the line output of a piece of audio equipment, such as an amplifier, tape recorder, etc., or to the audio output of another video recorder or a camera. Plug the AUDIO OUT plug of the ac adapter in here. When a plug is inserted in this jack, the signal from the TV tuner cannot be recorded.

⑳ VIDEO IN jack (phono type)
This jack accepts video signals from a camera, another video recorder, etc. When the plug is inserted in this jack, the signal from the TV tuner cannot be recorded.

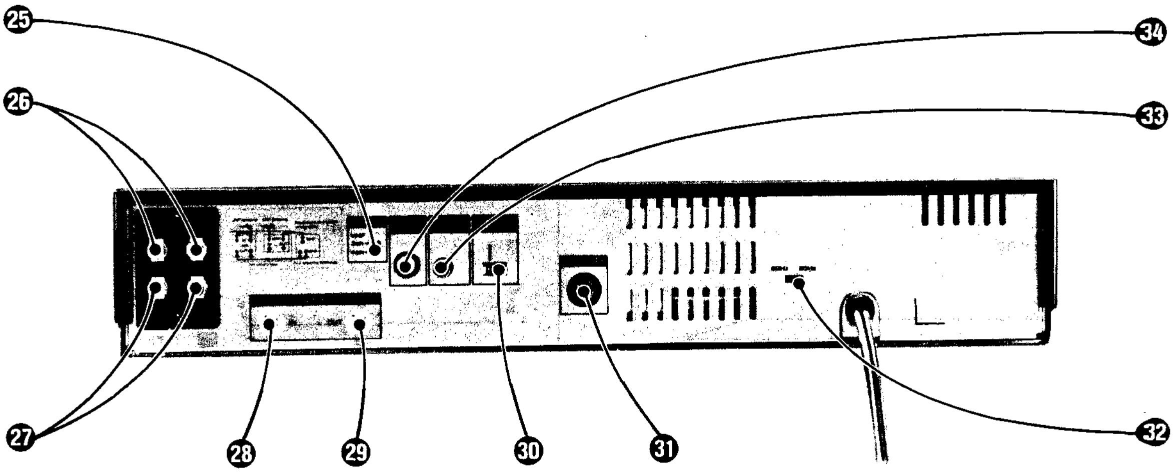
㉑ RECORD switch and lamp
Slide to the right to start recording. While a recording is being made, the lamp is lit.

㉒ PROGRAM SELECT button and VTR lamp
To view a TV program selected by a channel select button on the recorder or to monitor the picture being recorded, press this button so that the VTR indicator lights up. When the ▶ PLAY button on the recorder is pressed, the unit is automatically set in this mode. To view a TV program in the usual manner, press this switch so that the indicator goes off. When the recorder is turned off, the recorder is automatically set in this mode.

㉓ Channel select buttons and indicators
Select the channel to be recorded or to be viewed with these buttons. The selected channel number will light.

㉔ Tuning compartment
All the switches and buttons for channel presetting are in this compartment.

Rear



㉕ RF UNIT selector
Select the output channel at the VHF OUT terminal. Set the switch to 3ch or 4ch, whichever is not active in your area.

㉖ UHF IN terminals
Connect a UHF TV antenna here.

㉗ UHF OUT terminals
Connect to the UHF antenna terminals of the TV receiver to be able to view UHF TV programs even when the recorder is turned off.

㉘ VHF IN terminal
Connect a VHF TV antenna or CATV cable here.

㉙ VHF OUT terminal
Connect to the VHF antenna terminal of the TV receiver. The signal of a VTR program (converted to channel 3 or 4), the VHF TV signal and the CATV signal will be supplied to the TV receiver.

㉚ CAPTIONS/PCM switch
Normally set to the right position. For receiving captioned TV programs or for PCM recording and playback, set this switch to the left position.

㉛ CHANGER connector
Connect the optional Sony AG-500 cassette auto changer to this connector.

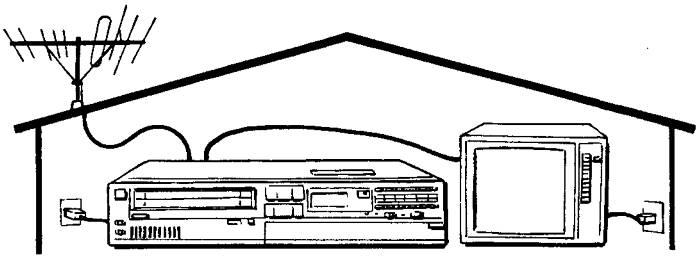
㉜ Frequency select switch
When you use this recorder in a 50 Hz area, set the switch to 50 Hz.

㉝ AUDIO OUT jack (phono type)
This jack provides the audio signals from this recorder.
Connect it to the line input of an audio equipment, such as an amplifier, tape recorder, etc., or to the audio input of another video recorder or a video monitor.

㉞ VIDEO OUT jack (phono type)
This jack provides the video signal from this recorder.
Connect it to the video input of another video recorder or a video monitor.

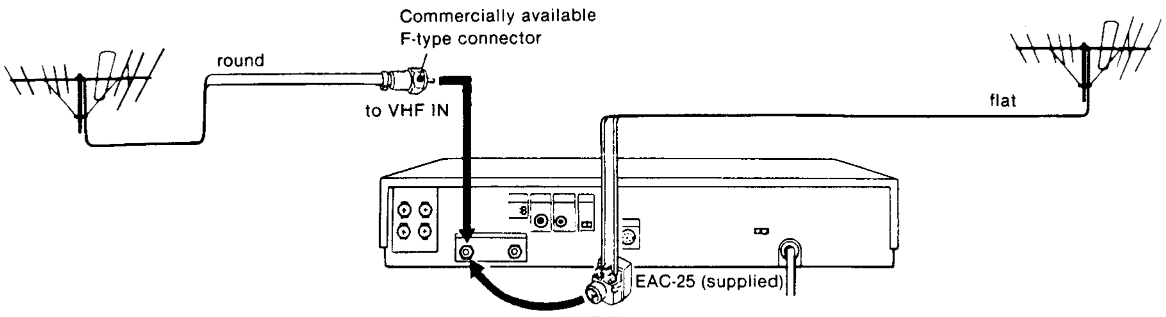
1-3. ANTENNA CONNECTIONS

Disconnect the TV antenna cables from the TV receiver and connect them to the recorder.

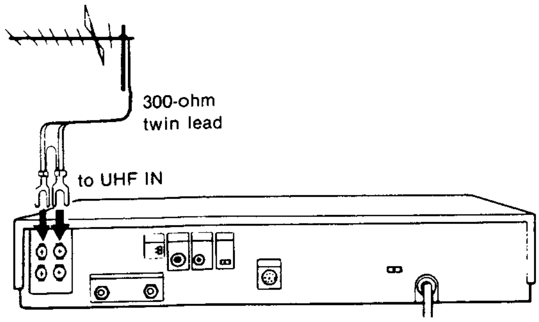


VHF antenna

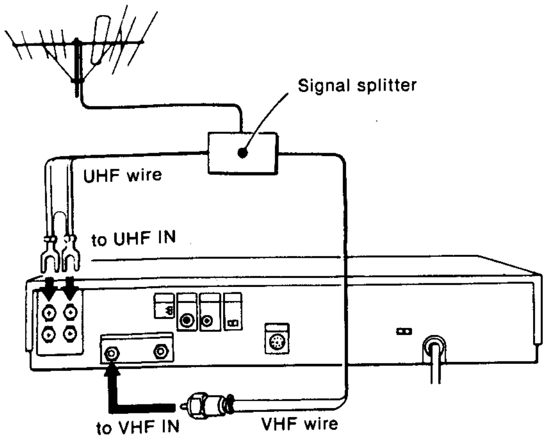
If the cable is a round 75-ohm coaxial cable **If the cable is a flat 300-ohm twin lead**


Commercially available F-type connector
round
to VHF IN
flat
EAC-25 (supplied)
to VHF IN

UHF antenna

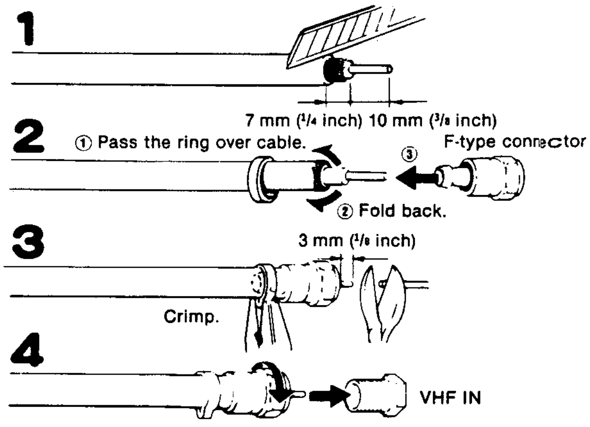

300-ohm twin lead
to UHF IN

Combination VHF/UHF antenna

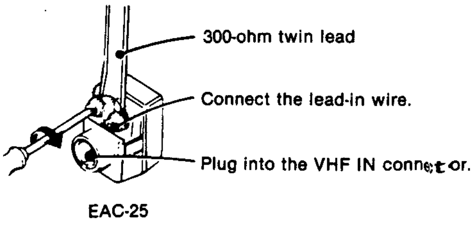

Signal splitter
UHF wire
to UHF IN
to VHF IN
VHF wire

Most combination antennas are equipped with a signal splitter. If you need a splitter or a complete antenna system, see your Sony dealer or a qualified technician.

How to attach an F-type connector


1
7 mm (1/4 inch) 10 mm (3/8 inch)
2
① Pass the ring over cable.
③
F-type connector
② Fold back.
3
3 mm (1/8 inch)
Crimp.
4
VHF IN

How to attach an EAC-25 external antenna connector

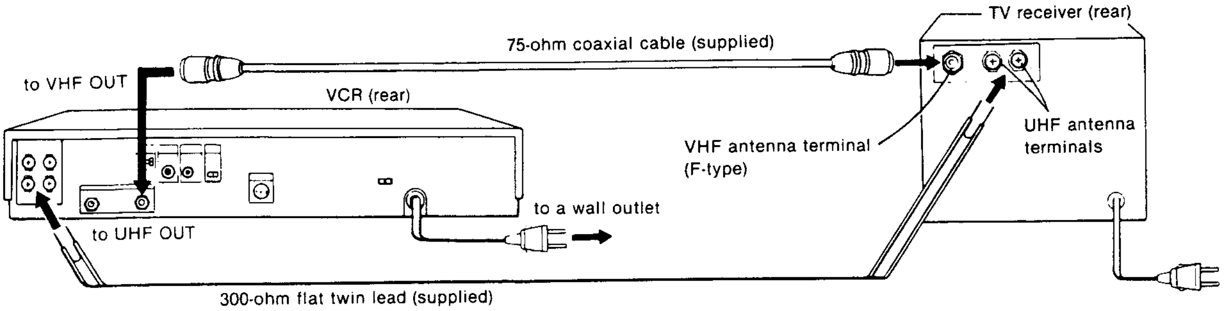

300-ohm twin lead
Connect the lead-in wire.
Plug into the VHF IN connector.
EAC-25

1-4. CONNECTING THE TV RECEIVER

Connecting a conventional TV receiver
Once the connections shown below have been made, the TV antenna signals, as well as the signal from the recorder, will be fed to the TV and you can view TV programs in the usual way.

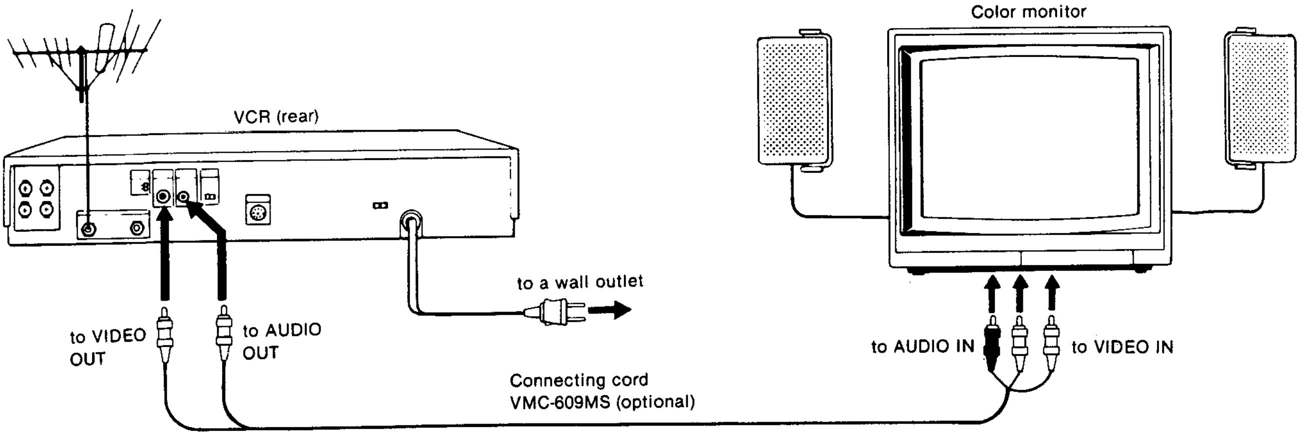
- Use an optional RFC-8 extension cable, 8 m (25 ft) long, if the supplied 75-ohm coaxial cable is not long enough.

Caution
Connections between the recorder VHF OUT connector and the antenna terminals of a TV receiver should be made only as shown in these instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of rf devices.
Never connect the output of the recorder to an antenna or make simultaneous (parallel) antenna and recorder connections at the antenna terminals of your receiver.


TV receiver (rear)
75-ohm coaxial cable (supplied)
to VHF OUT
VCR (rear)
VHF antenna terminal
(F-type)
UHF antenna terminals
to a wall outlet
to UHF OUT
300-ohm flat twin lead (supplied)

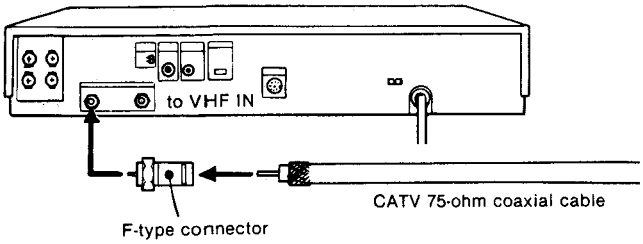
Connecting a color monitor
To obtain a better-quality picture, connect a color monitor, such as the Sony Profeel Trinitron Component TV, instead of a conventional TV receiver.

If you use a component TV tuner together with the monitor, connect the recorder and the TV tuner in the same way as in the case of the recorder and the conventional TV receiver described above.
For details on the connection of the TV tuner and the monitor, refer to the instruction manual of the TV tuner.


Color monitor
VCR (rear)
to a wall outlet
to VIDEO OUT
to AUDIO OUT
Connecting cord
VMC-609MS (optional)
to AUDIO IN
to VIDEO IN

1-5. CATV CABLE CONNECTION

This video cassette recorder receives 107 channels including 25 CATV channels A-2, A-1 and A through W.
Connect the CATV coaxial cable to the VHF IN jack on the recorder.


to VHF IN
CATV 75-ohm coaxial cable
F-type connector

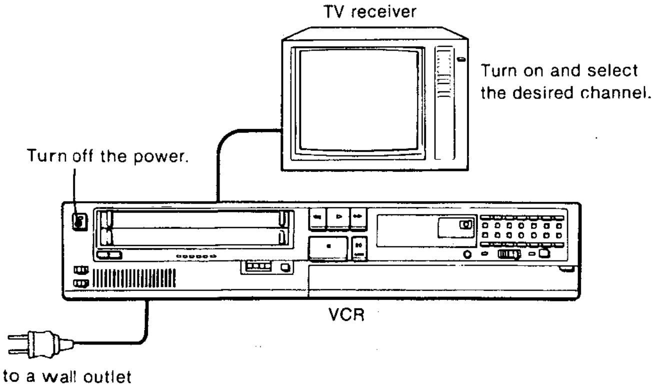
We recommend that you consult your cable company to make sure that the cable is properly connected. (Pay cable TV systems may use scrambled or encoded signals and may require special decoders.)

Note to CATV system installer in the U.S.A :

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

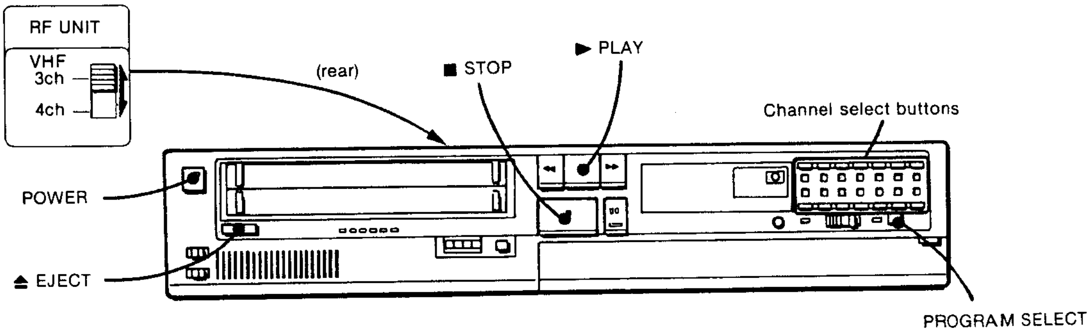
1-6. WATCHING TELEVISION

You can watch television in the usual way with the recorder connected.


TV receiver
Turn on and select the desired channel.
Turn off the power.
VCR
to a wall outlet

1-7. ADJUSTING THE TV

Adjust your TV receiver to receive the signal from your recorder. When you have connected a color monitor, the following adjustment is not necessary.



If you do not have a recorded video cassette tape

If you have a recorded video cassette tape

❶ Set the RF UNIT channel selector located at the rear of the recorder to 3CH or 4CH whichever channel is not active in your area.
❷ Push in the POWER switch. The lamp lights.

(If you do not have a recorded video cassette tape:)

❸ Press the PROGRAM SELECT button to turn the VTR lamp on.
❹ Select an active channel in your area with a channel select button on the recorder.

(If you have a recorded video cassette tape:)

❸ Insert the cassette with the round window to the left.
❹ Press the ▶ button.

❺ Turn on the TV.
❻ Set the TV receiver to either VHF channel 3 or 4 to agree with the setting of the RF UNIT channel selector.
The TV program selected on the recorder or the tape program will be displayed on the TV screen. If a picture does not appear on the TV screen or if the display is not clear, fine-tune the channel on the TV.
- For details about TV channel adjustment, see the instruction manual of the TV receiver.

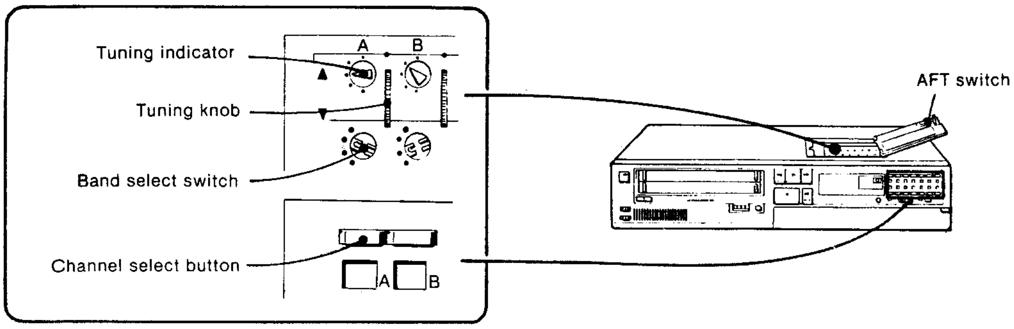
Check!
Check that the program displayed on the screen changes when a different channel select button on the recorder is selected.
If the program does not change, repeat the preceding steps.

Check!
Check that the display on the screen changes when you stop the tape by pressing the ■ button on the recorder. (To eject the cassette, press the ≜ button.)
If the program does not change, repeat the preceding steps.

Now your TV receiver is tuned to the recorder. Whenever you use the video recorder, you should set the TV to the channel which you have chosen above.

1-8. TO SET UP AND FINE-TUNE THE CHANNELS IN YOUR AREA

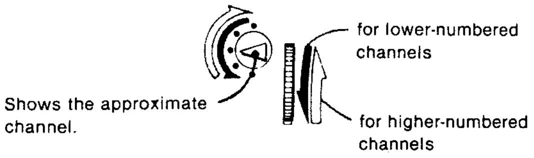
The channel select buttons are pre-adjusted at the factory to VHF channels 2 through 13 and to two UHF channels.
These pre-adjusted channels may be set up to receive any available VHF/UHF or CATV channels in your area. To set up and fine-tune channels, open the tuning compartment on the top of the recorder and proceed as follows :



① Turn the recorder and the TV receiver on.
② Make sure that the TV receiver is set to the correct channel for the video recorder.
③ Press the PROGRAM SELECT button to turn the VTR lamp on.
④ Push the recorder channel select button to be preset.
The associated channel indicator will light.
⑤ Set the band select switch associated with the pushed button to one of these positions : VL, M, VH•S or U. Use a screwdriver if necessary.

To tune in UHF channels 14 through 83 : U
To tune in VHF channels 7 through 13 and
CATV super-band channels J through W : VH • S
To tune in CATV mid-band channels A-2, A-1, and A through I : M
To tune in VHF channels 2 through 6 : VL

⑥ Tune by turning the corresponding tuning knob, watching the TV screen until the picture of the desired channel is clearly displayed and the sound is clear.

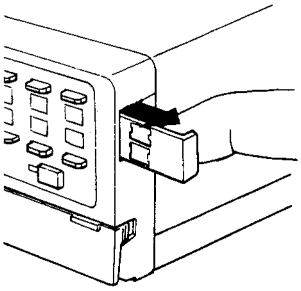

for lower-numbered channels
Shows the approximate channel.
for higher-numbered channels

To identify the channels, consult a newspaper, TV program guide or another TV set. If you have any problem on CATV channel presetting, consult the CATV company in your area.

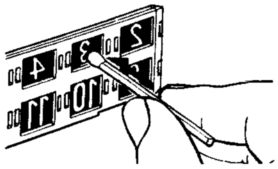
⑦ Repeat steps ④, ⑤ and ⑥ for the other channel select buttons.
⑧ When all stations have been set up as desired, check that the AFT switch is set to ON.

To replace the channel indicating segments
Channel indicating segments are supplied for identification of the preset channels. Insert the segments as follows :

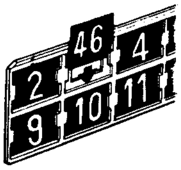
① Pull out the channel indication plate.



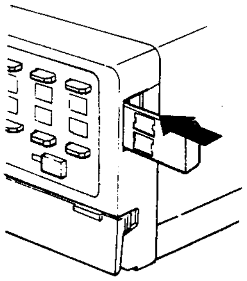
② Press the segment out from the rear.



③ Pick out the appropriate segments for the channels preset and insert them into the plate.



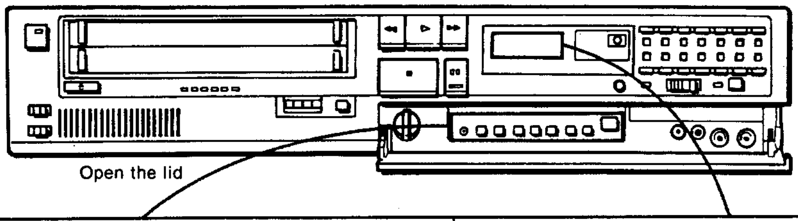
④ Replace the plate.

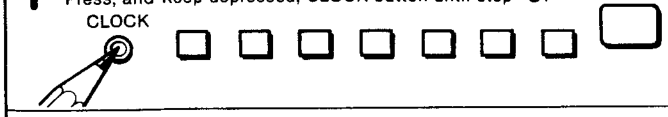
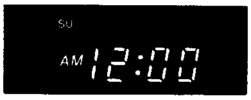
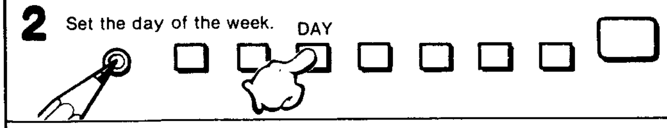
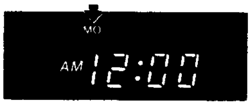
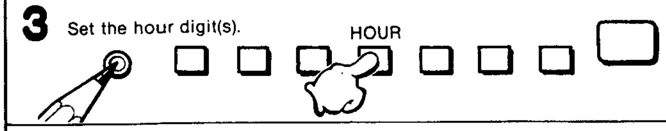
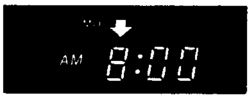
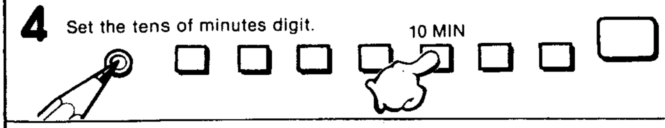
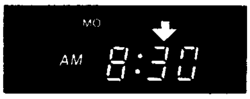
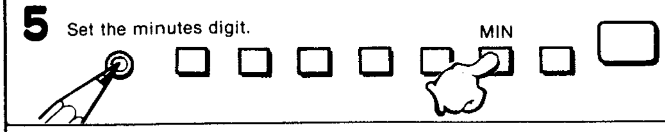
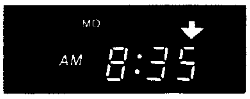
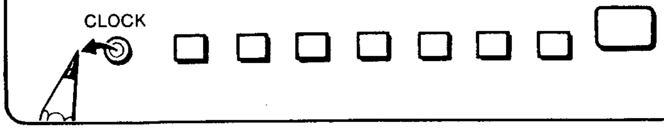
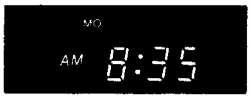


1-9. SETTING THE CLOCK

When you connect the ac power cord to a wall outlet, the clock indicates, "12:00 AM(SU)" and blinks to show that it must be set. To set the clock to **8:35 a.m. Monday,** for example, proceed as follows :

This clock will make a "cuckoo" sound on the hour.



Steps Indications will change consecutively each time you press the buttons.	**Time Display**
1 Press, and keep depressed, CLOCK button until step 6. 	 The indications will stop blinking.
2 Set the day of the week. 	 Day indications (SU through SA) will light in sequence.
3 Set the hour digit(s). 	 PM 12:00...noon AM 12:00...midnight
4 Set the tens of minutes digit. 	
5 Set the minutes digit. 	
6 With the time signal release CLOCK button. The moment you release, the clock will start. 	 The correct time will be shown. The upper dot blinks for the first half of each minute, and the lower dot for the second half.

The DAY, HOUR, 10 MIN and MIN buttons can be pressed in two ways :

When you hold a button down, the digits will advance continuously until the button is released.

When you press and immediately release a button, the digits will advance by one.

When a power interruption occurs

If a power interruption of more than approximately 5 minutes has occurred, the time indication "12:00 AM(SU)" will blink. Set the clock again.

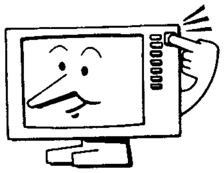
If the power interruption was about or less than 5 minutes, only the dots will blink and the displayed time will remain correct. Press CLOCK button to stop the blinking.

1-10. HOW TO RECORD TV PROGRAMS

Caution

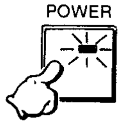
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.
Also, use of this recorder with cable television transmission may require authorization from the cable television transmitter and/or program owner.

1



Turn on the TV and select the channel for the video recorder.

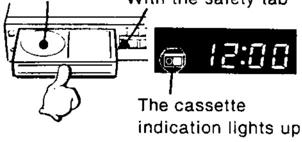
2 Turn on POWER switch



3 Insert a cassette.

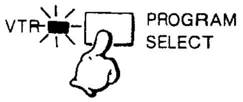
With the round window to the left

With the safety tab

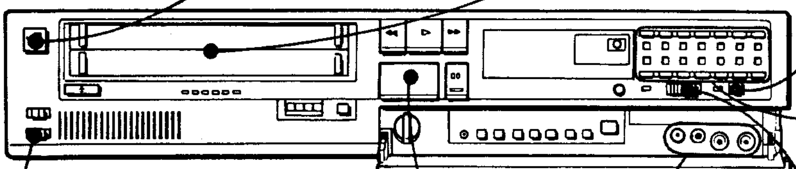


The cassette indication lights up.

4 Press PROGRAM SELECT button

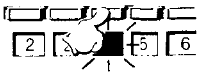


The lamp should light up.



Nothing should be connected to the CAMERA PAUSE, MIC, AUDIO IN and VIDEO IN jacks.

5 Select the channel to be recorded.



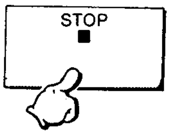
RECORD MODE selector
Set to either βII or βIII

Recording time available in each mode

Cassette used	βII	βIII
L-125	30 min.	45 min.
L-250	1 hr.	1 hr. 30 min.
L-500	2 hr.	3 hr.
L-750	3 hr.	4 hr. 30 min.
L-830	3 hr. 20 min.	5 hr.

7

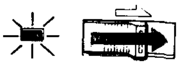
To stop recording,
press STOP button.



When the tape reaches its end, it will be rewound to the beginning.

To eject the cassette, press the ⏏ button.

6 Slide to the right.



Recording will begin
If a cassette is not inserted or the inserted cassette has its safety tab removed, there will be an announcement, and the inserted cassette will automatically be ejected.

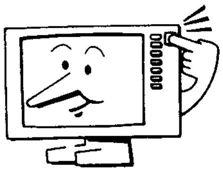
RECORDING ONE TV PROGRAM WHILE VIEWING ANOTHER

You can record a TV program selected on the recorder while viewing another TV program.
❶ Start recording the desired TV program following the above procedures.
❷ Press the PROGRAM SELECT button so that the VTR lamp goes off.
❸ Select the channel you want to view on the TV.

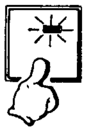
To stop the tape momentarily
Press the ❚❚ PAUSE button. The lamp on the button will blink.
The TV program can be seen on the TV, but the picture will not be recorded.
To resume recording, press the button again.
To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and recording will resume.

1-11. HOW TO PLAYBACK A RECORDED TAPE

1 Turn on the TV and select the channel for the video recorder.

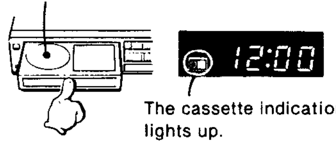


2 Turn on POWER switch



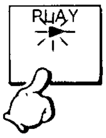
3 Insert a cassette.

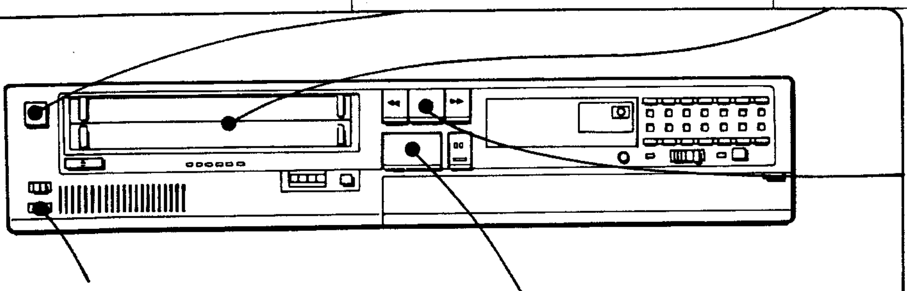
With the round window to the left



The cassette indication lights up.

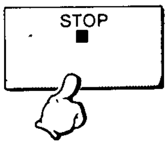
4 Press PLAY button.





During playback, the ßI , ßII or ßIII mode is automatically selected depending on which mode the tape to be played back was recorded in.

To stop playing

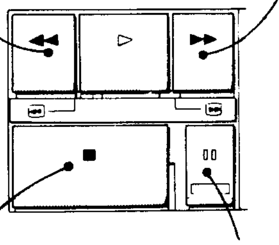


To eject the cassette, press the ⏏ button.

USE OF FUNCTION BUTTONS

◀◀ REW (rewind) button
Press to rewind the tape.
Use also for the backward Betascan operation.

▶▶ FF (fast forward) button
Press to advance the tape rapidly.
Use also for the forward Betascan operation.



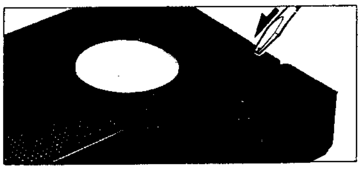
■ STOP button
Press to stop the tape.
The tape will be automatically rewound to the beginning when it reaches the end during recording or playback.

II PAUSE button
Press to stop the tape for a moment during playback.
The lamp above the button will light.
A freeze picture will be seen on the TV screen.
To resume playback, press the button again. The pause mode will be automatically released after about 8 minutes, as in the record mode.

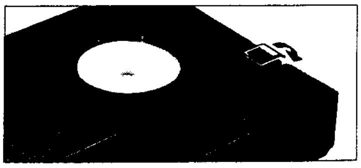
TO KEEP A RECORDED PROGRAM FROM BEING ACCIDENTALLY ERASED

When a new recording is made on a previously recorded cassette, the previous recording will be automatically erased.

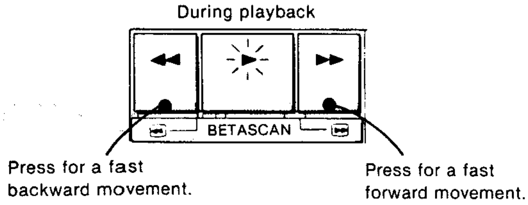
To avoid erasing a recording
Break off the safety tab using a screwdriver or similar object.



To re-record on a cassette which has had its safety tab removed
Cover the hole with a piece of plastic tape.

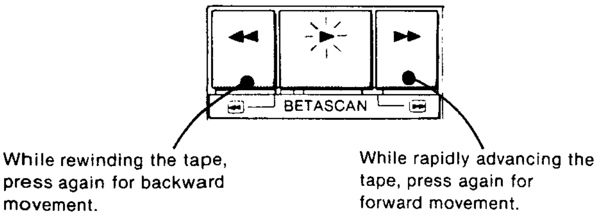


BETASCAN ... **Viewing the picture at a fast speed to find a particular scene**

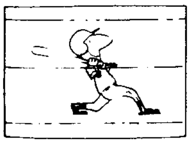

During playback
◀◀
▶
▶▶
BETASCAN
Press for a fast backward movement.
Press for a fast forward movement.

At the desired point, release the button.
The normal playback will resume.

BETA SKIPSCAN ... **Viewing the picture momentarily during rewind or fast-forward**


◀◀
▶
▶▶
BETASCAN
While rewinding the tape, press again for backward movement.
While rapidly advancing the tape, press again for forward movement.

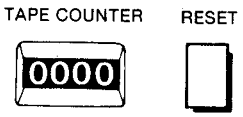
At the desired point, release the button. The normal rewind/fast forward mode will resume.

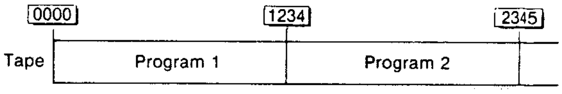


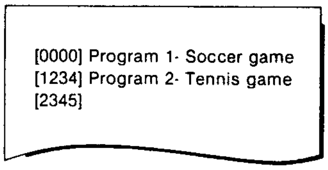
Streaks will appear and sound will be muted during Betascan or Beta SkipScan operation.

USING THE TAPE COUNTER

Before starting recording or playback, press the RESET button so that the TAPE COUNTER indicates "0000". The counter numbers change as the tape moves.
Write down the counter readings at the desired points on the tape. You can easily find these points later by referring to the TAPE COUNTER.


TAPE COUNTER
RESET
0000


0000
1234
2345
Tape
Program 1
Program 2



[0000] Program 1- Soccer game
[1234] Program 2- Tennis game
[2345]

1-12. TIMER-ACTIVATED RECORDING

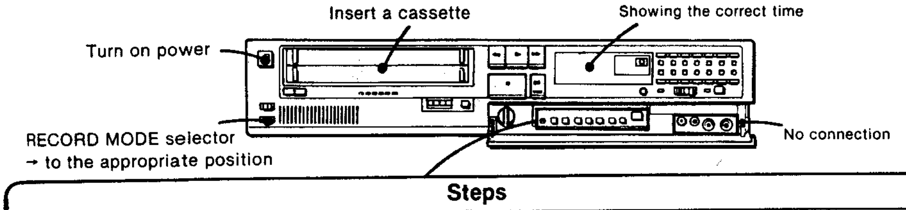
The built-in timer permits automatic recording of up to 4 preselected programs, even when you are not at home. The timer can be set to operate anytime between the day you preset the programs and the 3rd or (if the day of presetting is Saturday) the 2nd Saturday from that day.

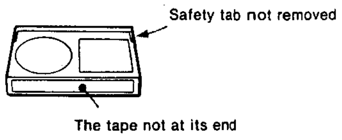
Suppose you want to make a recording on Friday of next week from 4:25 p.m. to 5:30 p.m. in program position B.

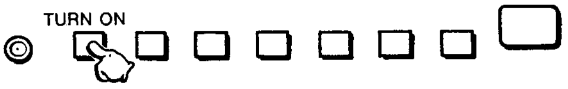
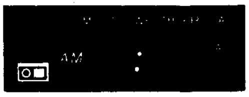
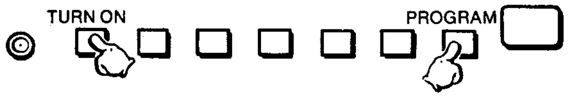
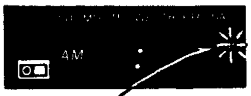
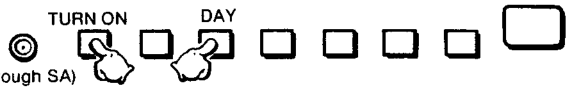
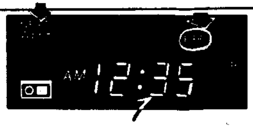
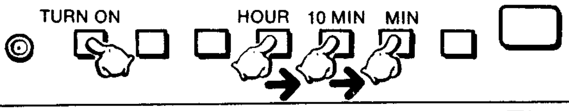
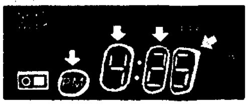
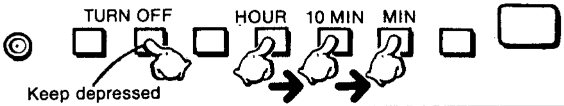
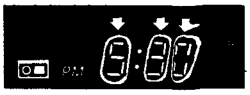
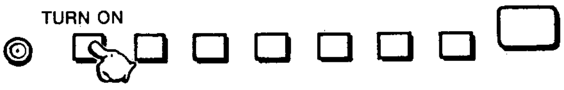
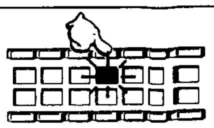
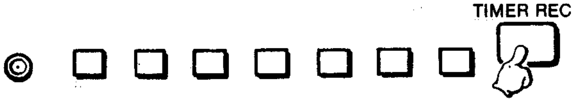
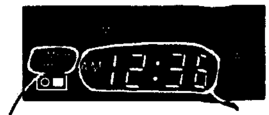
SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	⑥	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

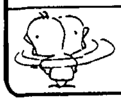
The day you set the timer

Possible days for recording.


Insert a cassette
Showing the correct time
Turn on power
RECORD MODE selector
→ to the appropriate position
No connection


Safety tab not removed
The tape not at its end

Steps	Time Display
1 Press, and keep depressed, TURN ON button until Step 4. 	
2 Press PROGRAM button to choose a program position (A, B, C or D).  TURN ON PROGRAM	 Program indication will change in alphabetical order each time you press.
3 Set the turn-on day.  Day indications for this week (SU through SA) will light first, all at once, then in sequence. Day indications for next week and the week after next will follow consecutively with the indications "NEXT WEEK" and "WEEK AFTER NEXT".	 Present time
4 Set the turn-on time  TURN ON HOUR 10 MIN MIN	
5 Set the turn-off time  TURN OFF HOUR 10 MIN MIN Keep depressed	
6 Select the channel to be recorded.  While pressing the TURN ON button, press the button of the desired channel.	
7 Press TIMER REC button  With the announcement that the timer is set properly, the "TIMER REC" indication will light up and the present time will be shown again. The power of the VCR will be turned off, but at the preset turn-on and -off time, recording will begin and stop automatically. You will hear an announcement at both the start and the end of the recording. To set timer-recordings on other program positions, release TIMER REC button, turn POWER on, and repeat steps 1 through 7.	 Lights up Present time



If a cassette was not inserted or the inserted cassette had its safety tab removed, there will be an announcement and the cassette indication will blink. Power will not be turned off as it should and the inserted cassette will be ejected automatically.

ONCE THE TIMER REC LAMP HAS LIT UP, NO FUNCTION OF THE RECORDER CAN BE ACTIVATED, except the confirmation announcements. To turn on the power again for the usual manual operations, release TIMER REC button. This does "not" affect the memory of the timer. As long as you press it again, timer recording will be made exactly as preset.

When the timer-activated recording is finished

1. Press TIMER REC button to release it.
2. Press POWER button and rewind the tape by pressing the REW button.
3. Press EJECT button and take out the cassette.

The memorized turn-on and -off time of each program in the timer will be erased one by one after each recording. Only, if you have set the timer to record everyday, memory will not be erased unless you preset a new program on the same program position.

To check the timer setting

Using the CONFIRMATION button
Press the CONFIRMATION button. Each time you press, the turn-on and -off time of your settings will be announced. Your timer setting with the earlier turn-on time will be announced first.

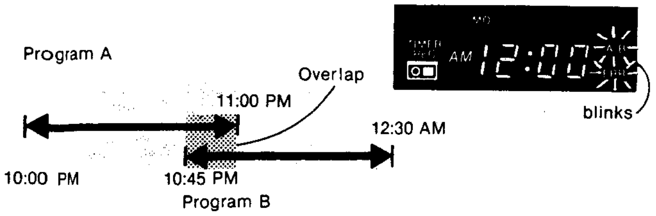
You can adjust the volume of the announcements.
OFF : for cutting off the voice
SOFT : for a low voice
LOUD : for a louder voice

Checking the timer without the announcement

1. Release TIMER REC button and turn on POWER.
2. While pressing the TURN ON button, consecutively press PROGRAM button until the alphabetical indication of the program you'd like to check is lit. The time shown then is the turn-on time of that program.
3. Press TURN OFF button. The turn off time will be shown.
4. Repeat steps 1 and 2 for checking the timer settings of other programs.

When the presettings of your timer-activated recordings overlap

There will be an announcement to inform you of the overlap.
The program indications of the overlapping programs and the error indication "ERR" will blink. Check the settings and erase one of them.

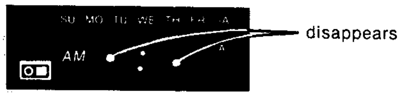


Even if there is an overlap, recording will be made. In this case, the first recording will be made until the recording of the following program begins. This means that the recording preset for the earlier time will be cut off in the middle.

To erase the setting of a program

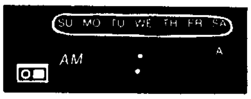
1. Release TIMER REC button.
2. Turn power on.
3. While pressing the TURN ON button, press PROGRAM button consecutively until the program indication and the turn-on time of whichever program you would like to erase is displayed.
4. Without releasing the TURN ON button, press TURN OFF button.

The timer setting will be erased.



More about timer recording

To make a recording everyday at the same time
Set the turn-on day so that day indications (SU through SA) are lit all at once.



If you wish to skip a day's recording, release TIMER REC button for just that day. Press it again and recordings for the following days will be made.

To record to the end of the tape

There are two ways.
—Set the timer so that the turn-on and -off time coincide.
—Erase any previous timer setting made, and set only the turn-on time.
When the CONFIRMATION button is pressed, only the turn-on time will be announced.

At the end of the tape the power of the recorder will be turned off. In timer-activated recordings, tape will not be rewound automatically.

When a power interruption occurs before or during timer recording

If a power interruption of more than approximately 5 minutes has occurred,
the time indication "12:00 AM(SU)" will blink. This means that the memory of the timer has been completely erased.
Set the clock and the timer again. In this case, the recording which had been in process will not resume.

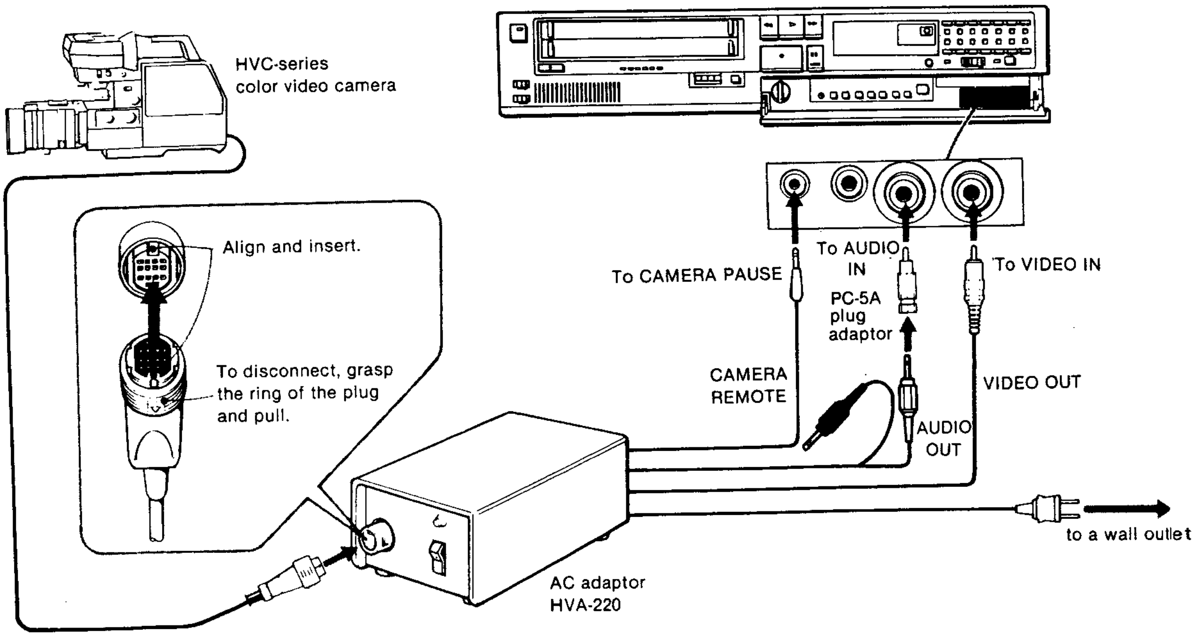
If, after a power interruption, the clock still shows the correct time with the two dots blinking,
the interruption was less than or nearly 5 minutes. In this case, the memory of the timer is retained and recording will be made. All you have to do is to press the CLOCK button to stop the blinking.
The recording which had been in process before the interruption will resume.

1-13. CAMERA RECORDING

... For producing your own programs

CONNECTIONS

- The camera must conform to American TV (EIA) standards.
- The use of a Sony HVA-220 ac adaptor is required.

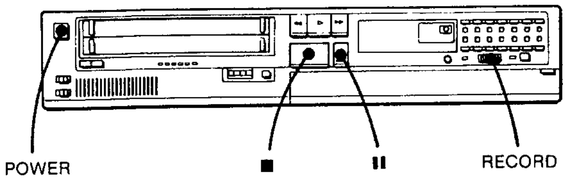

HVC-series color video camera
Align and insert.
To disconnect, grasp the ring of the plug and pull.
To CAMERA PAUSE
To AUDIO IN
PC-5A plug adaptor
To VIDEO IN
CAMERA REMOTE
VIDEO OUT
AUDIO OUT
AC adaptor HVA-220
to a wall outlet

To record the sound from a microphone
Plug a microphone into the MIC jack. If the microphone has a phone type plug, use a Sony PC-1A plug adaptor.

- When both the MIC and AUDIO IN jacks are connected, the sound from the microphone will be recorded.

To record the sound from other audio sources
Connect an audio source, such as a tape recorder, into the AUDIO IN jack.

OPERATION


POWER
■
II
RECORD

❶ Press the POWER switch to turn on the recorder and insert a cassette.
❷ Turn on the power switch on the ac adaptor.
❸ Make the necessary adjustments on the camera. See the instruction manual furnished with the camera.
❹ Slide the RECORD switch to the right. Recording will begin.

- If a camera with a tape run/stop button is used, you can momentarily stop recording and restart it using that button.
- If any other camera is used, use the **II** button on the recorder or the PAUSE button on the remote control unit to stop the recording momentarily and restart it.

To stop recording, press the ■ button.

To view the picture being recorded on the TV screen
❶ Turn the connected TV on.
❷ Select the channel for the video recorder on the TV.
❸ Press the PROGRAM SELECT button so that the VTR lamp lights up.
The picture being recorded will appear on the TV screen.

- If acoustic feedback (a whistle-like sound) is heard when the microphone sound is recorded, turn the microphone (or the camera, if the microphone is built into the camera) away from the TV or turn down the TV volume.

1-14. CLOSED CAPTION RECORDING AND PLAYBACK

This video cassette recorder has the capability of recording and playing back closed caption television programs for the hearing-impaired, when connected to a decoder unit or TV receiver designed to receive closed caption signals.
For playback, the CAPTIONS/PCM switch located at the rear of the recorder must be set to the left position.
Connection between the recorder and the decoder unit will depend on the unit you purchase. See the instruction manual supplied with the decoder.

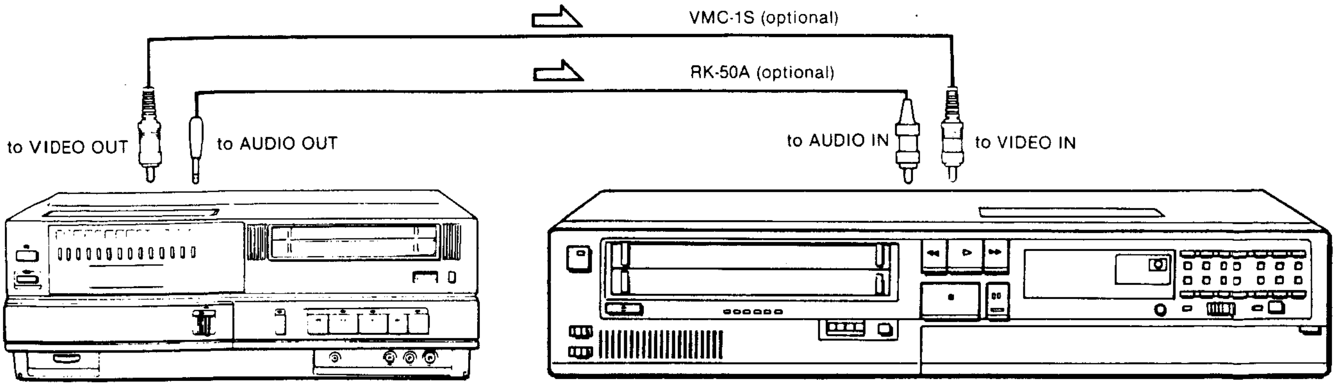
1-17. PCM RECORDING AND PLAYBACK

By connecting a PCM digital audio processor (Sony PCM-F1, etc.) you can enjoy hi-fi sound reproduction with a wide dynamic range, minimal distortion and a flat frequency response.
For playback, the CAPTIONS/PCM switch at the rear of the recorder must be set to the left position.
Connection between the recorder and the PCM digital audio processor will depend on the unit used. Follow the instruction manual of the digital audio processor.

1-15. TAPE COPY

CAUTION
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized duplication of such material may be contrary to the provisions of the copyright laws.

To duplicate a tape you will need two video recorders ; one is to play back the original tape and the other is to duplicate.

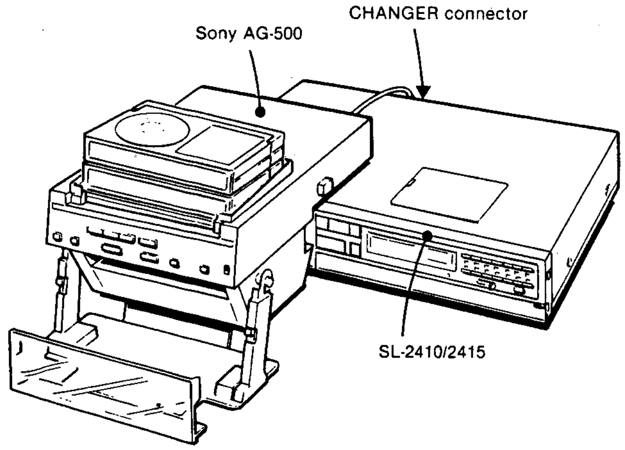


Recorder for playback

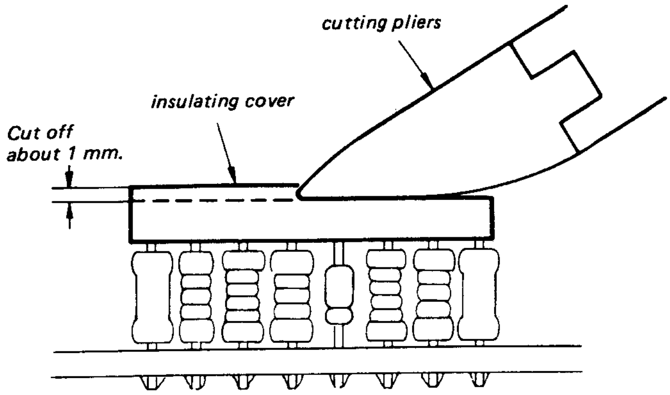
Recorder for duplicating

1-16. AUTOMATIC CASSETTE CHANGE

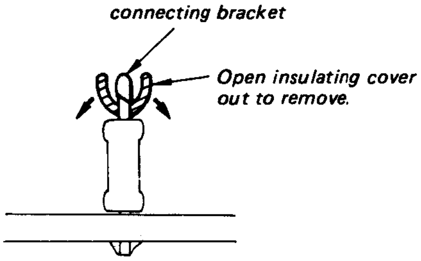
By using the optional Sony AG-500 cassette auto changer, up to four cassettes can be recorded, played back or rewound automatically.
Using the timer built into the recorder, you can record a long program on four consecutive cassettes or four different programs on four separate cassettes, all without your being there.

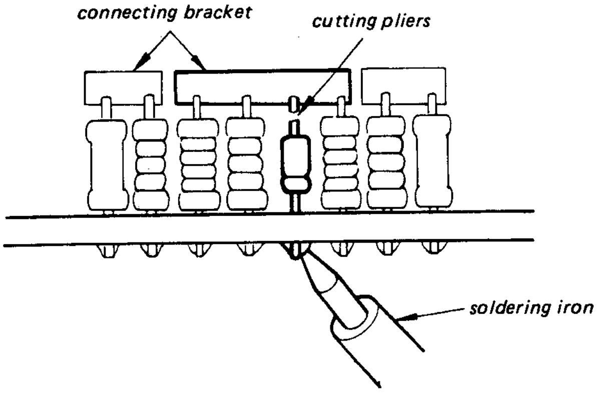


REPAIR METHOD FOR HYBRID CIRCUIT BLOCK

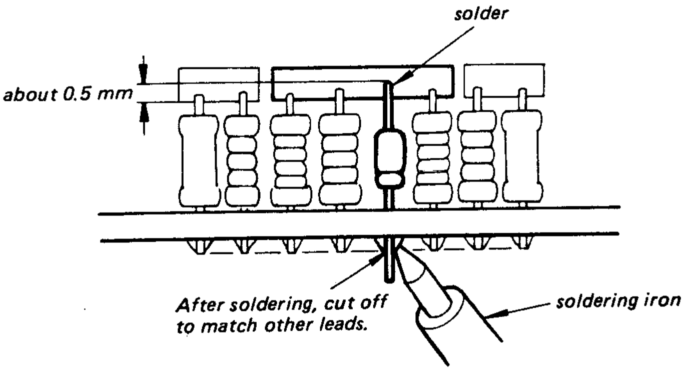

cutting pliers
insulating cover
Cut off
about 1 mm.

Using a cutting pliers, cut off the upper portion of the insulating cover about 1 mm, exposing the top of the connecting brackets.

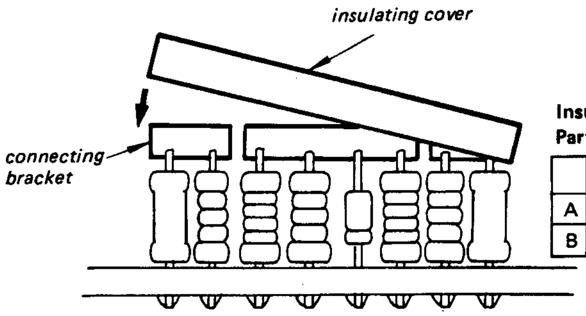

connecting bracket
Open insulating cover
out to remove.


connecting bracket
cutting pliers
soldering iron

Cut off the lead of the defective part with cutting pliers. Remove solder and take out the defective part.


solder
about 0.5 mm
After soldering, cut off
to match other leads.
soldering iron

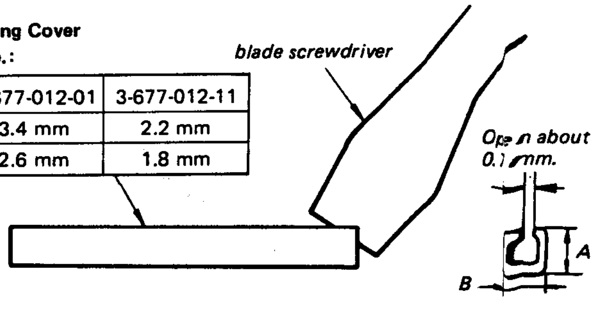
Insert the new part on the board and solder the lead to the board. Cut off the lead on the connecting bracket side so that it overlaps by about 0.5 mm, and solder to the connecting bracket.


insulating cover
connecting
bracket

Open the insulating cover groove about 0.7 mm and place over the connecting brackets, positioning one end first.

Insulating Cover Part No.:

	3-677-012-01	3-677-012-11
A	3.4 mm	2.2 mm
B	2.6 mm	1.8 mm


blade screwdriver
Open about
0.7 mm.
A
B

Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

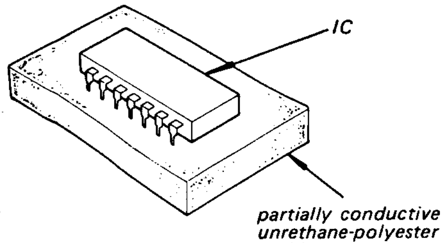

IC
partially conductive unrethane-polyester cushion

Fig. A

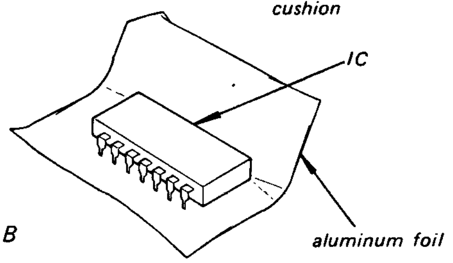

IC
aluminum foil

Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

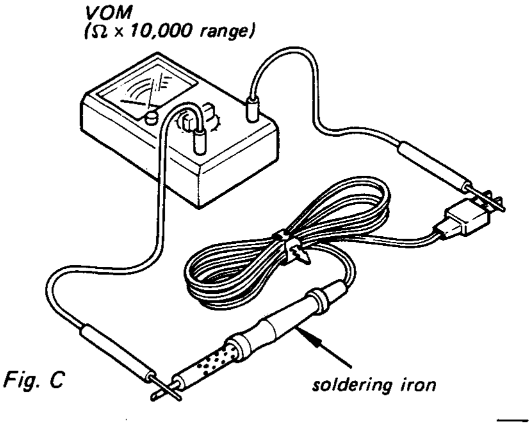

VOM
(Ω x 10,000 range)
soldering iron

Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.
4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

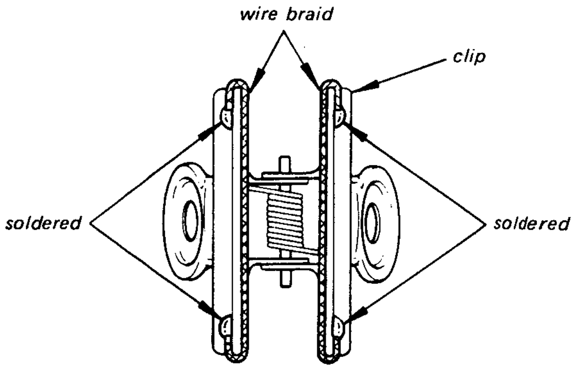

wire braid
clip
soldered
soldered

Fig. D Make sure that there is no solder on the inside.

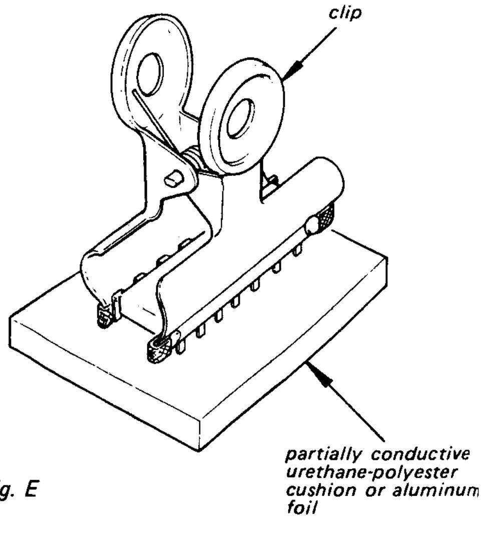

clip
partially conductive urethane-polyester cushion or aluminum foil

Fig. E

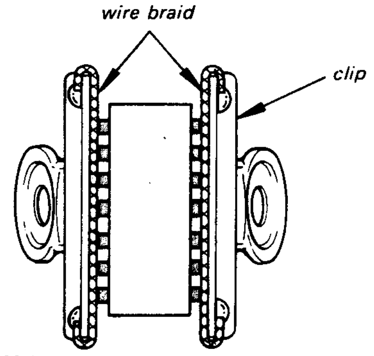

wire braid
clip

Fig. F Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

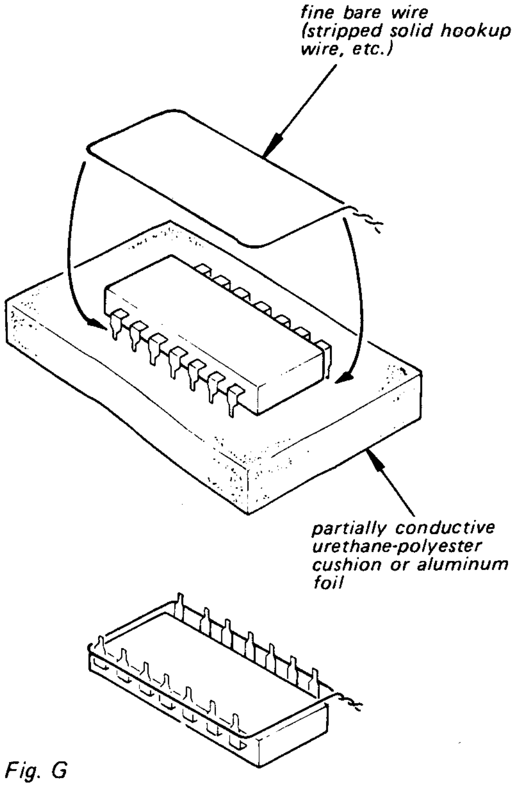

fine bare wire
(stripped solid hookup wire, etc.)
partially conductive urethane-polyester cushion or aluminum foil

Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

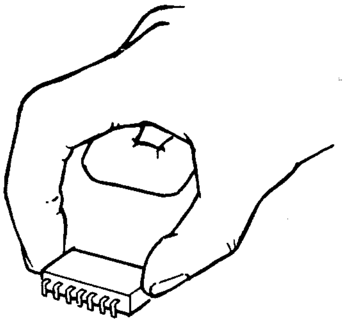


Fig. H

5. Method of Mounting
Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B- voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

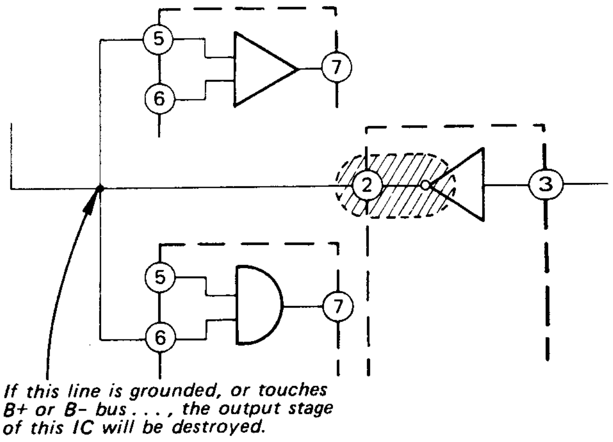

5
6
7
2
3
5
6
7
If this line is grounded, or touches B+ or B- bus . . . , the output stage of this IC will be destroyed.

Fig. I

SECTION 2
DISASSEMBLY AND REPLACEMENT

2-1. CABINET ASSEMBLY REMOVAL

❶. Remove the four case set screws.

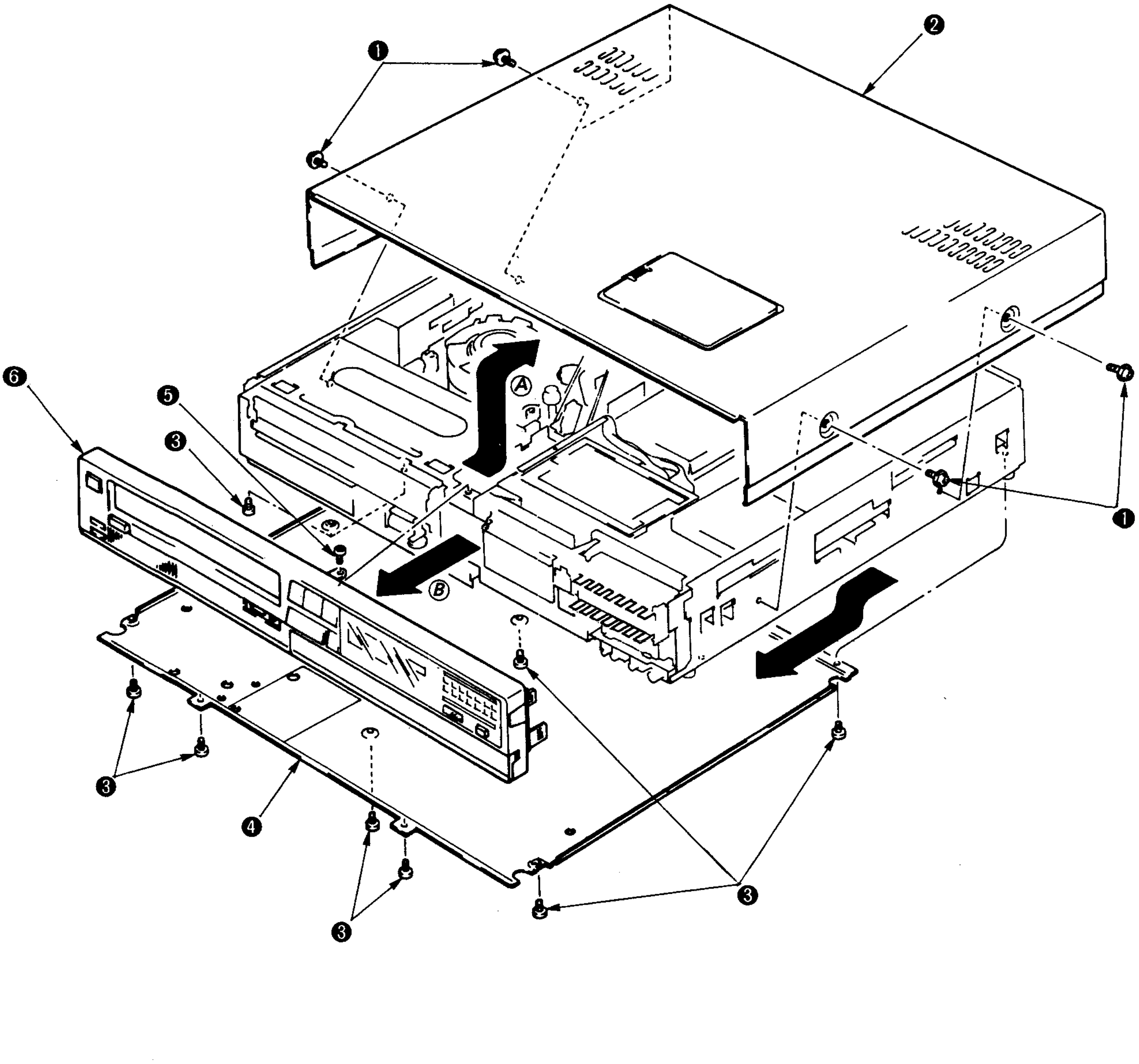
❷. Remove the upper case in the direction of the arrow Ⓐ.

❸. Remove the ten screws (BVTT2.6 x 8).

❹. Remove the plate bottom.

❺. Remove the screw (BVTT2.6 x 8).

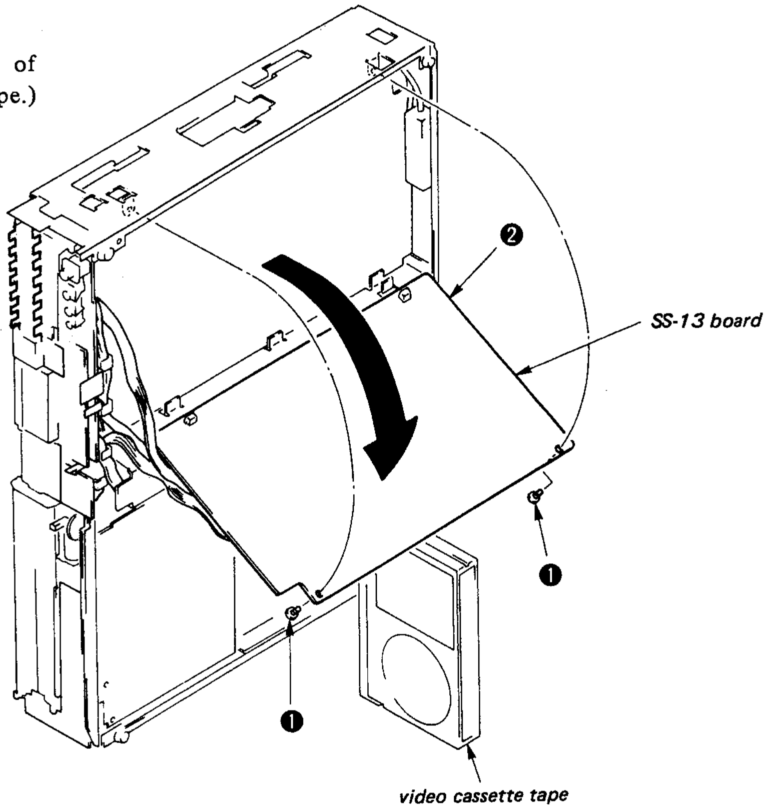
❻. Remove the front panel ass'y in the direction of the arrow Ⓑ.



2-2. SS-13 BOARD REMOVAL

❶. Remove the two screws (BVTT2.6 x 6).

❷. Remove the SS-13 board in the direction of the arrow. (Supported using a video cassette tape.)

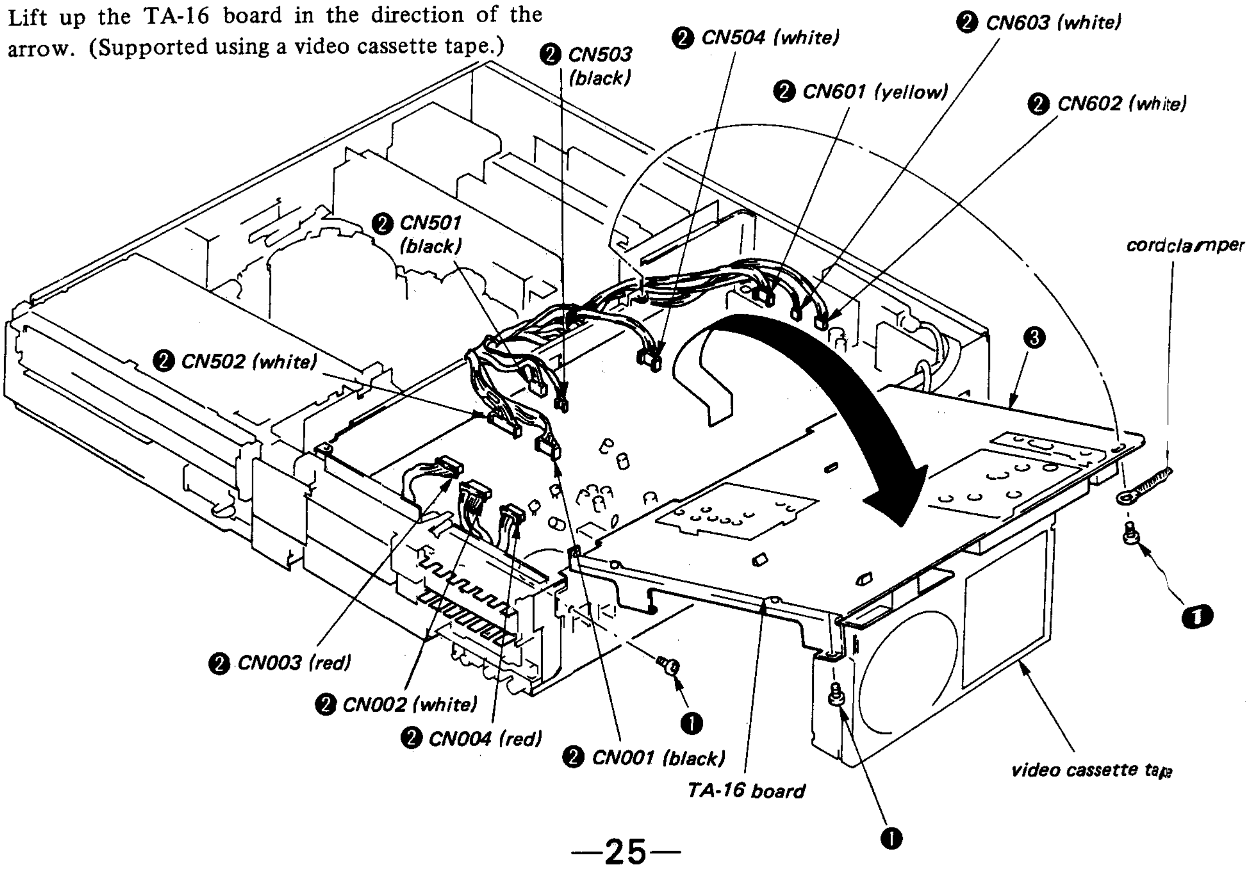

❷
SS-13 board
❶
❶
video cassette tape

2-3. TA-16 BOARD REMOVAL

❶. Remove the three screws (BVTT2.6 x 6).

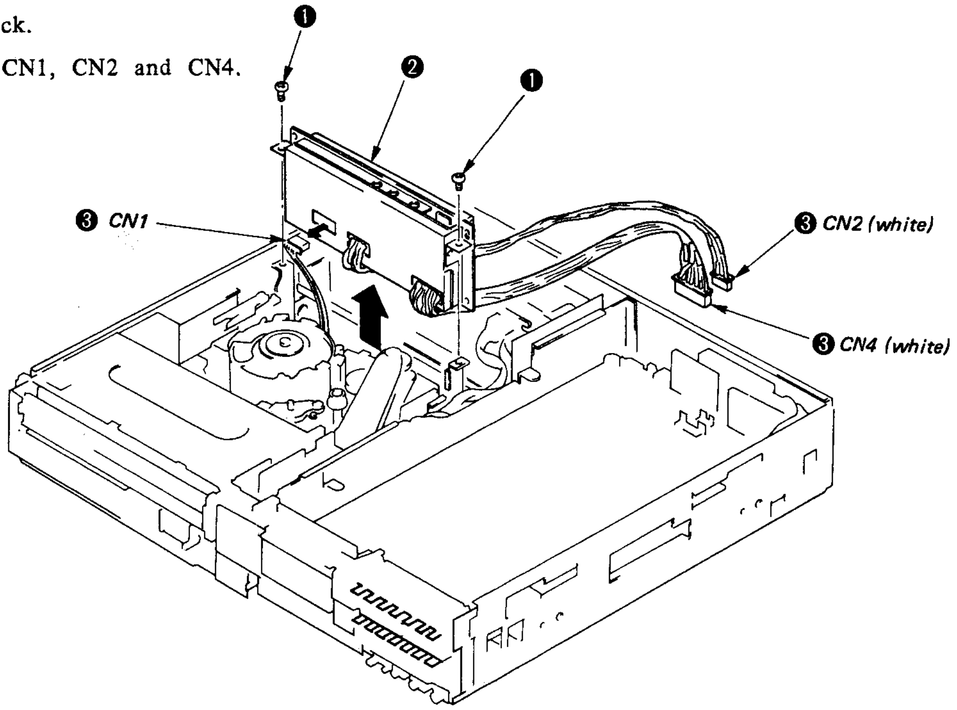
❷. Pull out the eleven connectors.

❸. Lift up the TA-16 board in the direction of the arrow. (Supported using a video cassette tape.)


❷ CN503 (black)
❷ CN504 (white)
❷ CN603 (white)
❷ CN601 (yellow)
❷ CN602 (white)
❷ CN501 (black)
cordclamper
❷ CN502 (white)
❸
❶
❷ CN003 (red)
❷ CN002 (white)
❷ CN004 (red)
❶
❷ CN001 (black)
TA-16 board
video cassette tape
❶

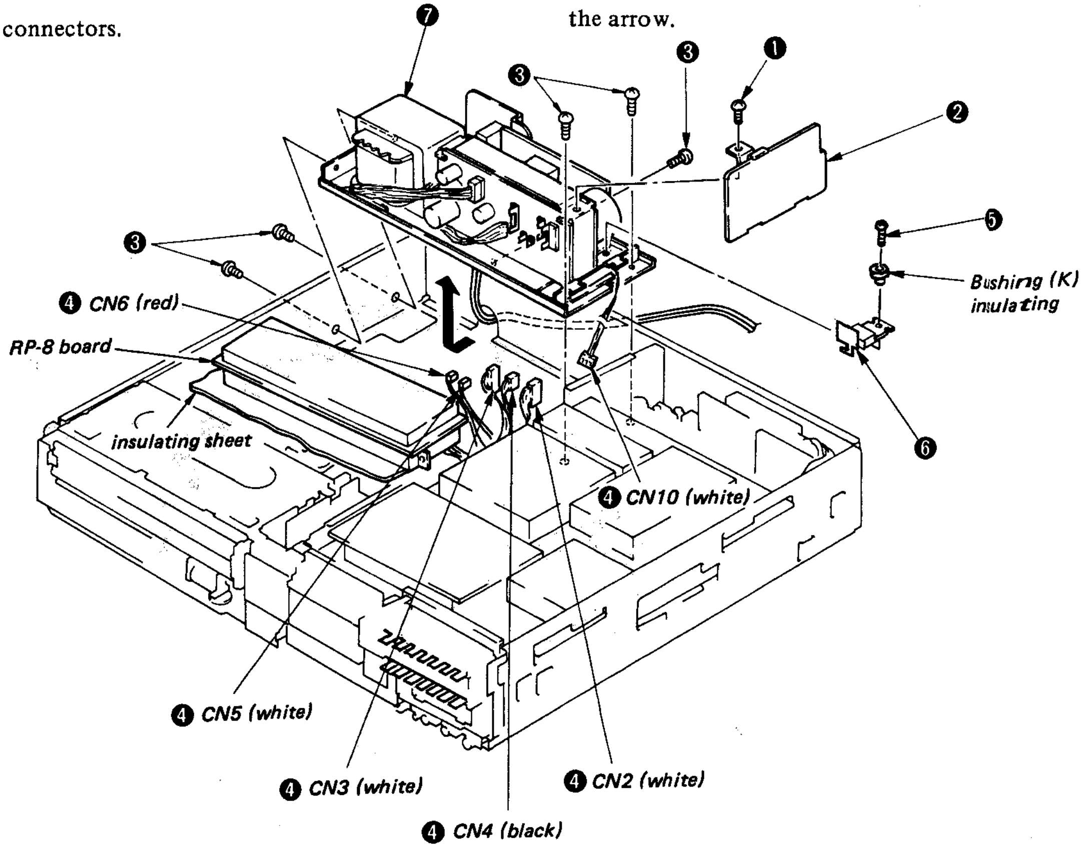
2-4. RP-8 BOARD REMOVAL

❶. Remove the two screws. (BVTT2.6 x 6)
❷. Remove the RP-8 board block.
❸. Pull out the connectors. CN1, CN2 and CN4.


❶
❷
❶
❸ CN1
❸ CN2 (white)
❸ CN4 (white)

2-5. POWER BLOCK REMOVAL

❶. Remove the screw. (BVTT2.6 x 6)
❷. Remove the CI-5 board.
❸. Remove the five screws. (BVTT2.6 x 6)
❹. Pull out the six connectors.
❺. Remove the screws. (BVTT2.6 x 8)
❻. Remove the PS-29 board.
❼. Remove the power block in the direction of the arrow.


❼
❸
❸
❶
❷
❸
❺
Bushing (K) insulating
❻
❹ CN6 (red)
RP-8 board
insulating sheet
❹ CN10 (white)
❹ CN5 (white)
❹ CN3 (white)
❹ CN2 (white)
❹ CN4 (black)

2-6. TIMER BLOCK REMOVAL

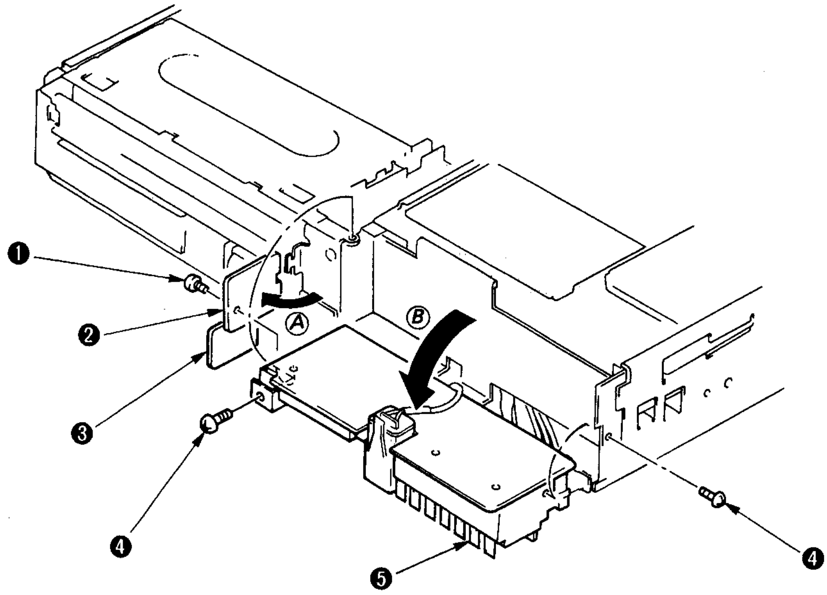
❶. Remove the screw (PTP2.6 x 8).

❷. Remove the FS-19 board in the direction of the arrow Ⓐ .

❸. Remove the FS-29 board.

❹. Remove the two screws (BVTT2.6 x 6).

❺. Remove the TIMER BLOCK in the direction of the arrow Ⓑ .



2-7. REEL BLOCK REMOVAL

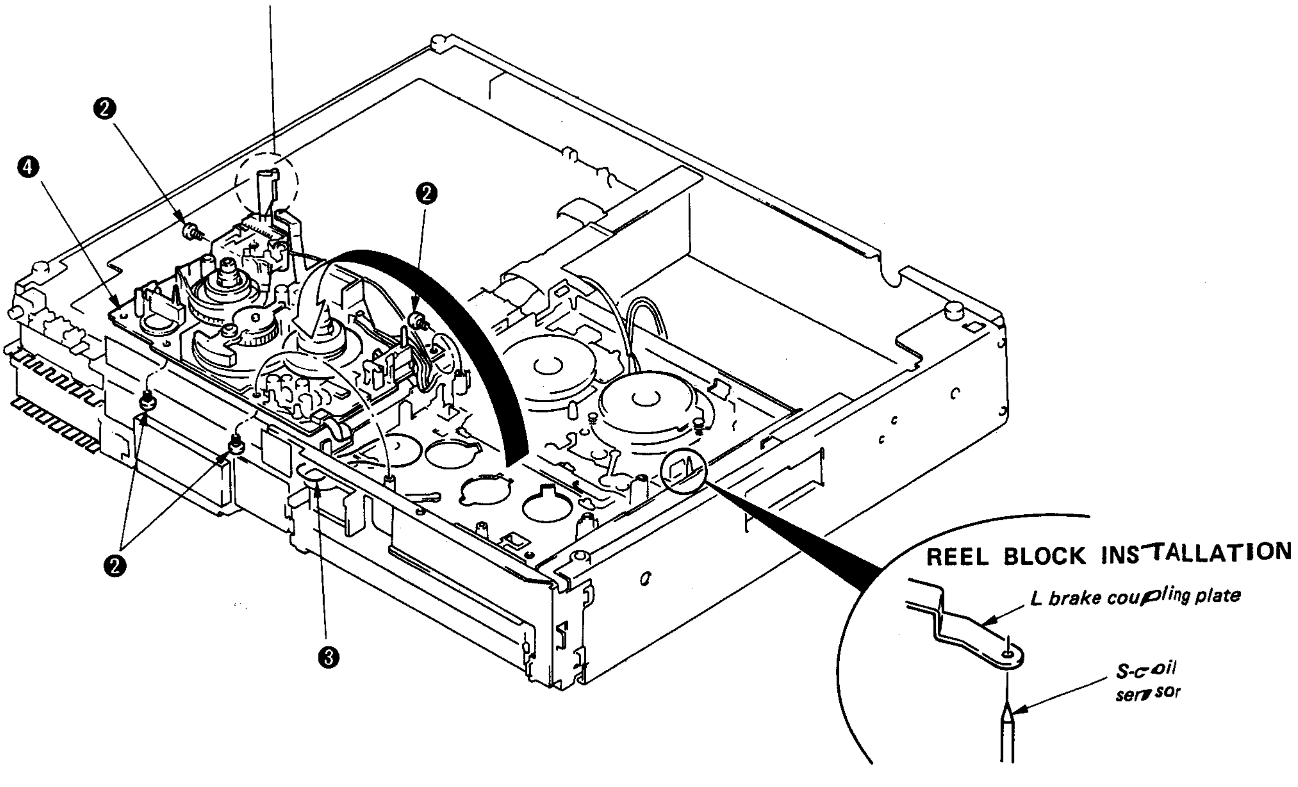
❶. Turn the upper panel upside down.

❷. Remove the four screws (TA, B2.6 x 8).

❸. Remove the counter belt.

❹. Remove the reel ass'y

Remove with care to so that the tension regulator lever does not hitch on the chassis.


❷
❹
❷
❷
❸
REEL BLOCK INSTALLATION
L brake coupling plate
S-coil sensor

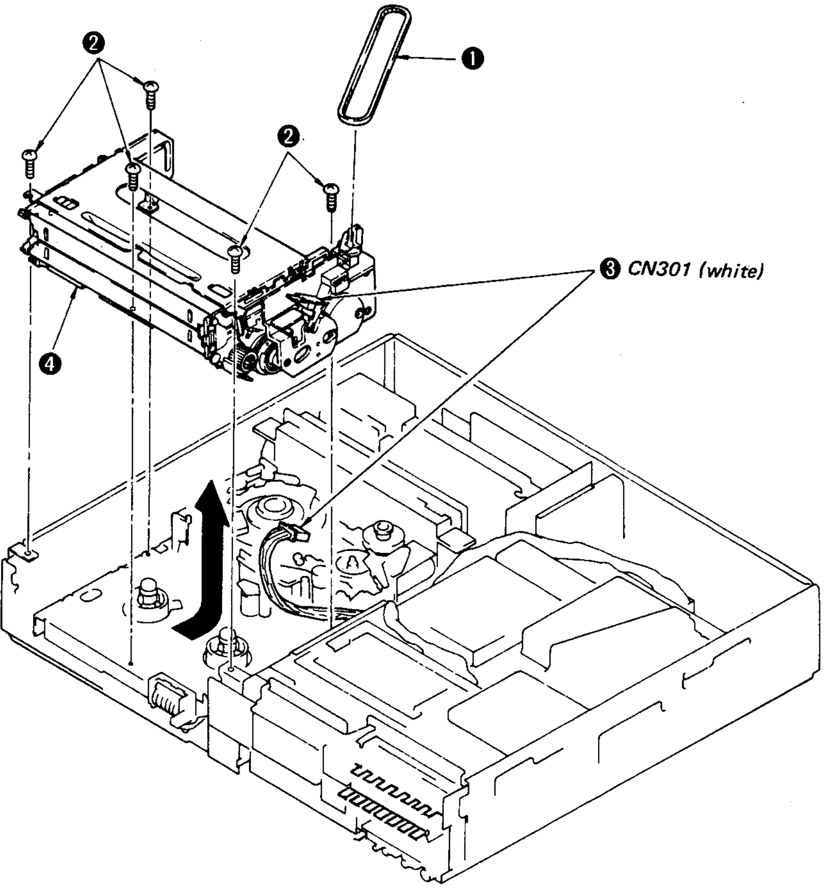
2-8. FL CASSETTE COMPARTMENT ASSY REMOVAL

➊. Remove the synchro belt.

➋. Remove the five screws (BVTT2.6 x 6)

➌. Pull out the connector.

➍. Remove the FL cassette compartment ass'y in the direction of the arrow.



➋
➊
➋
➌ CN301 (white)
➍

2-9. LOADING AND THREADING MOTORS REMOVAL

➊. Remove the synchro belt.

➋. Remove the screw (PSW2.6 x 5).

➌. Remove the screw (PSW, small 2.6).

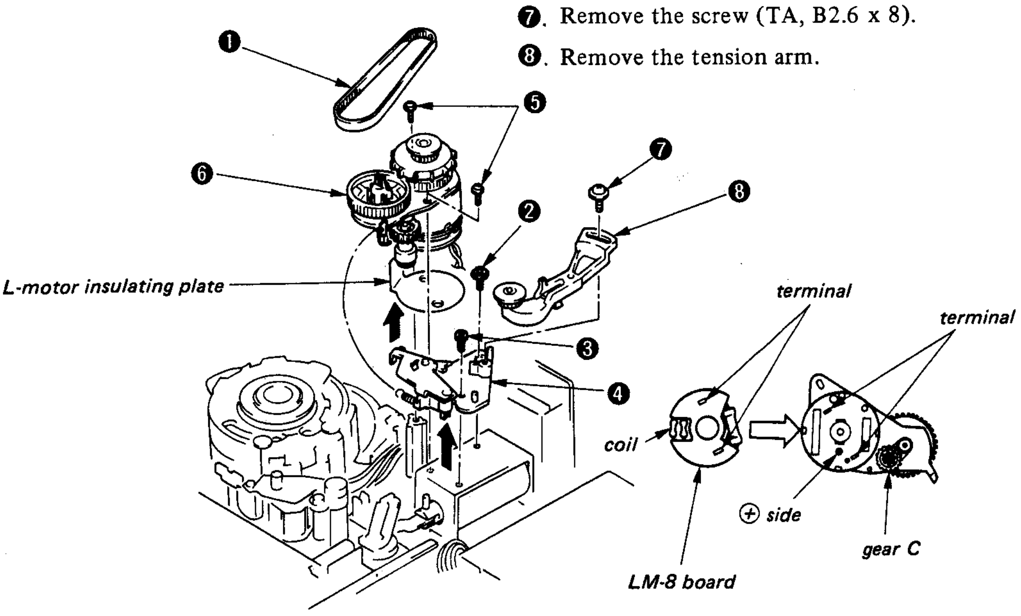
➍. Remove the stopper arm block.

➎. Remove the two screws (PTPWH2).

➏. Remove the loading motor block.

➐. Remove the screw (TA, B2.6 x 8).

➑. Remove the tension arm.



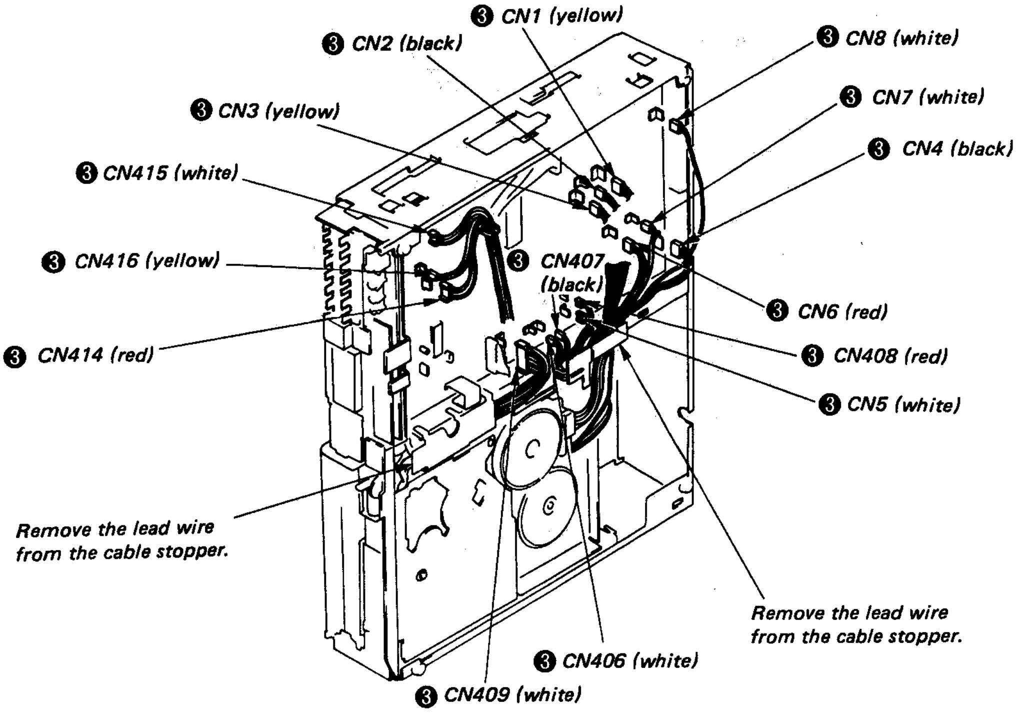
➊
➎
➏
➐
➑
➋
L-motor insulating plate
terminal
terminal
➌
➍
coil
⊕ side
gear C
LM-8 board

2-10. MECHANICAL CHASSIS BLOCK REMOVAL (1)

❶. Place the main unit with a left side panel on the bottom.

❷. Disconnect the connector from SS-13 board.

❸. Remove the connector and then remove the lead wires from the cable stopper or harness stopper.


❸ CN1 (yellow)
❸ CN2 (black)
❸ CN8 (white)
❸ CN7 (white)
❸ CN3 (yellow)
❸ CN4 (black)
❸ CN415 (white)
❸ CN416 (yellow)
❸ CN407 (black)
❸ CN6 (red)
❸ CN408 (red)
❸ CN414 (red)
❸ CN5 (white)
Remove the lead wire from the cable stopper.
Remove the lead wire from the cable stopper.
❸ CN406 (white)
❸ CN409 (white)

2-11. MECHANICAL CHASSIS BLOCK REMOVAL (2)

❶. Remove the screw (BVTT2.6 x 6).

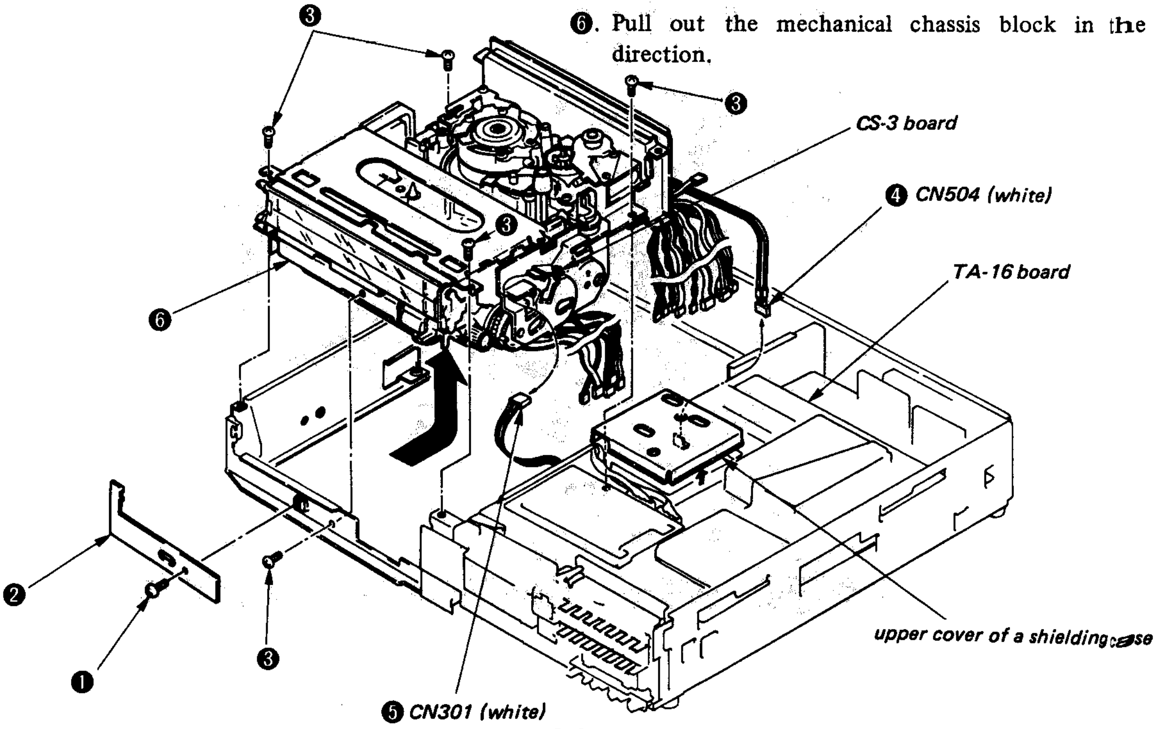
❷. Remove the FS-28 board.

❸. Remove the five screws (BVTT2.6 x 6).

❹. Remove the upper cover of a shielding case on the TA-16 board and pull out the connector CN504.

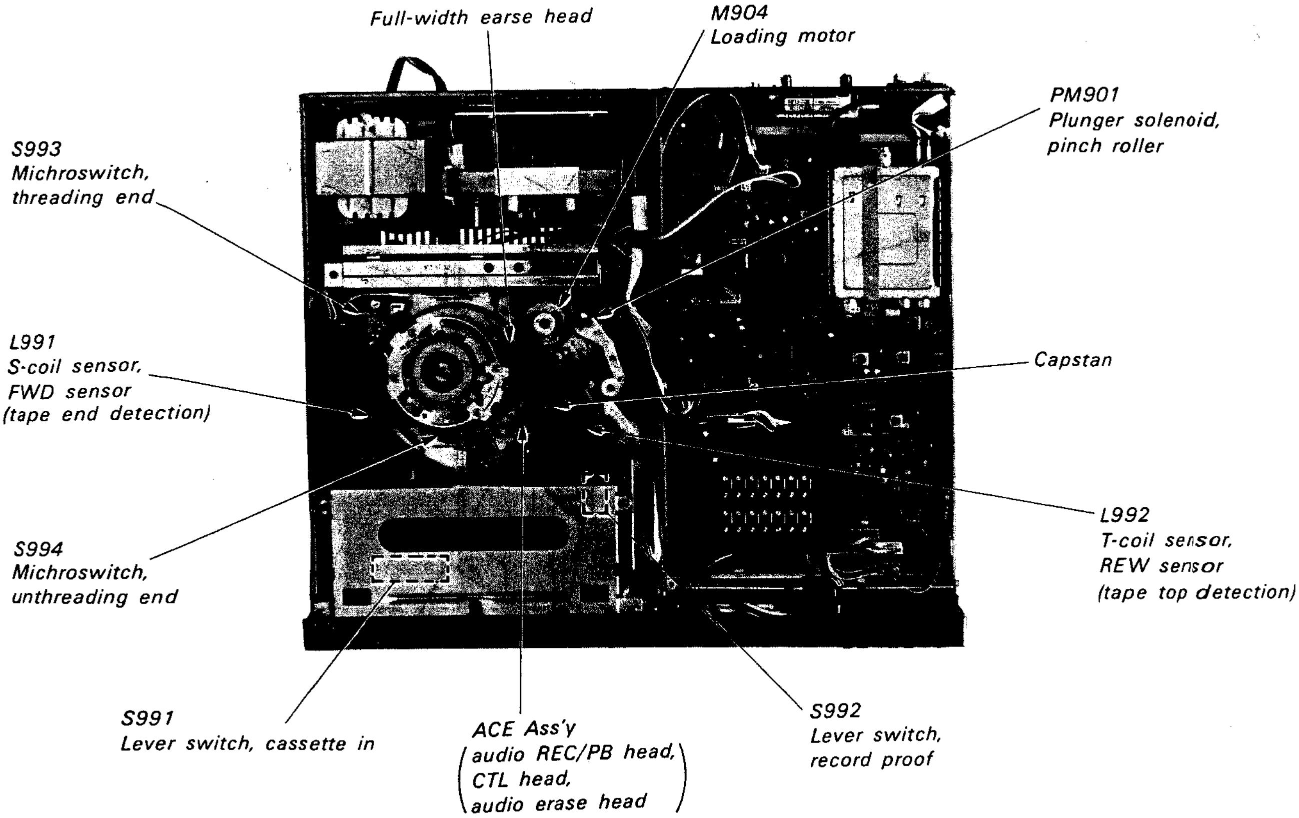
❺. Disconnect the connector CN301 from CS-3 board.

❻. Pull out the mechanical chassis block in the direction.

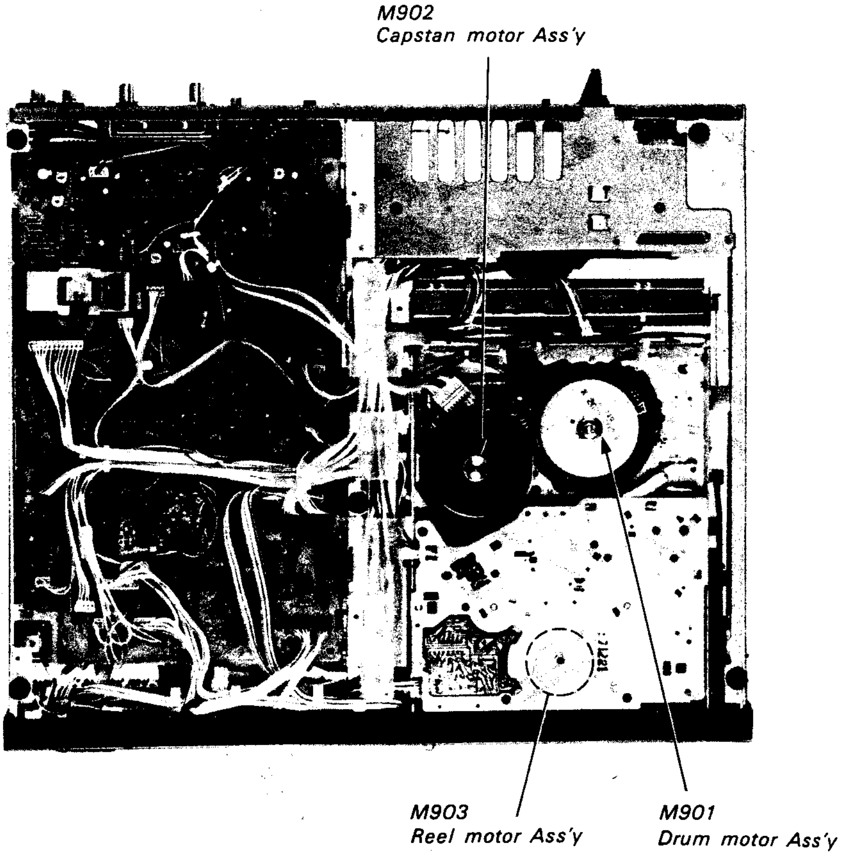

❸
❸
CS-3 board
❹ CN504 (white)
❸
TA-16 board
❻
❷
❸
❶
upper cover of a shielding case
❺ CN301 (white)

2-12. INTERNAL VIEWS

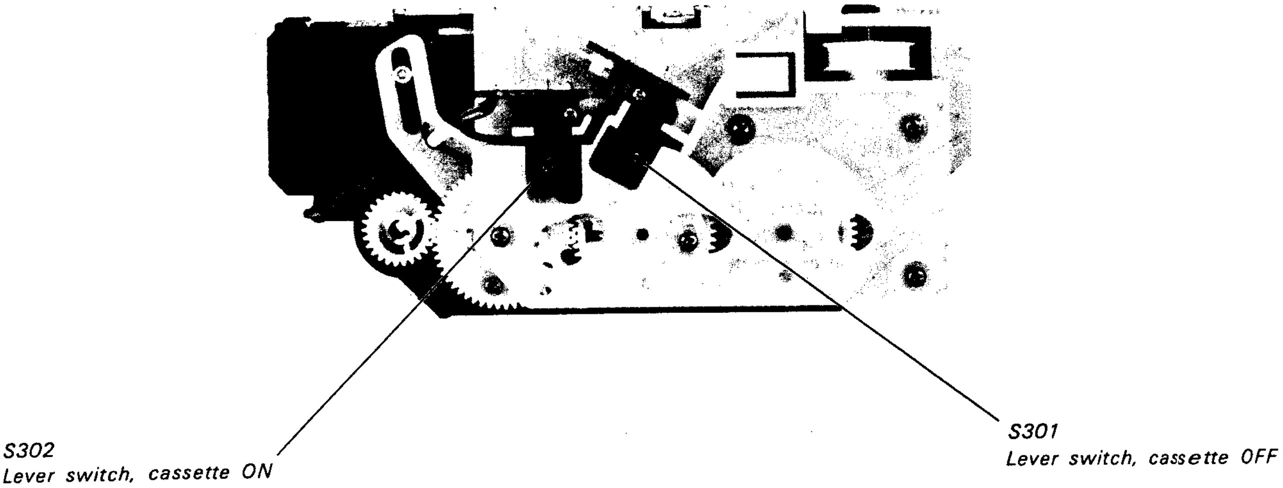
—Top side—


Full-width earse head
M904
Loading motor
S993
Michroswitch,
threading end
PM901
Plunger solenoid,
pinch roller
L991
S-coil sensor,
FWD sensor
(tape end detection)
Capstan
L992
T-coil sensor,
REW sensor
(tape top detection)
S994
Michroswitch,
unthreading end
S991
Lever switch, cassette in
ACE Ass'y
(audio REC/PB head,
CTL head,
audio erase head)
S992
Lever switch,
record proof

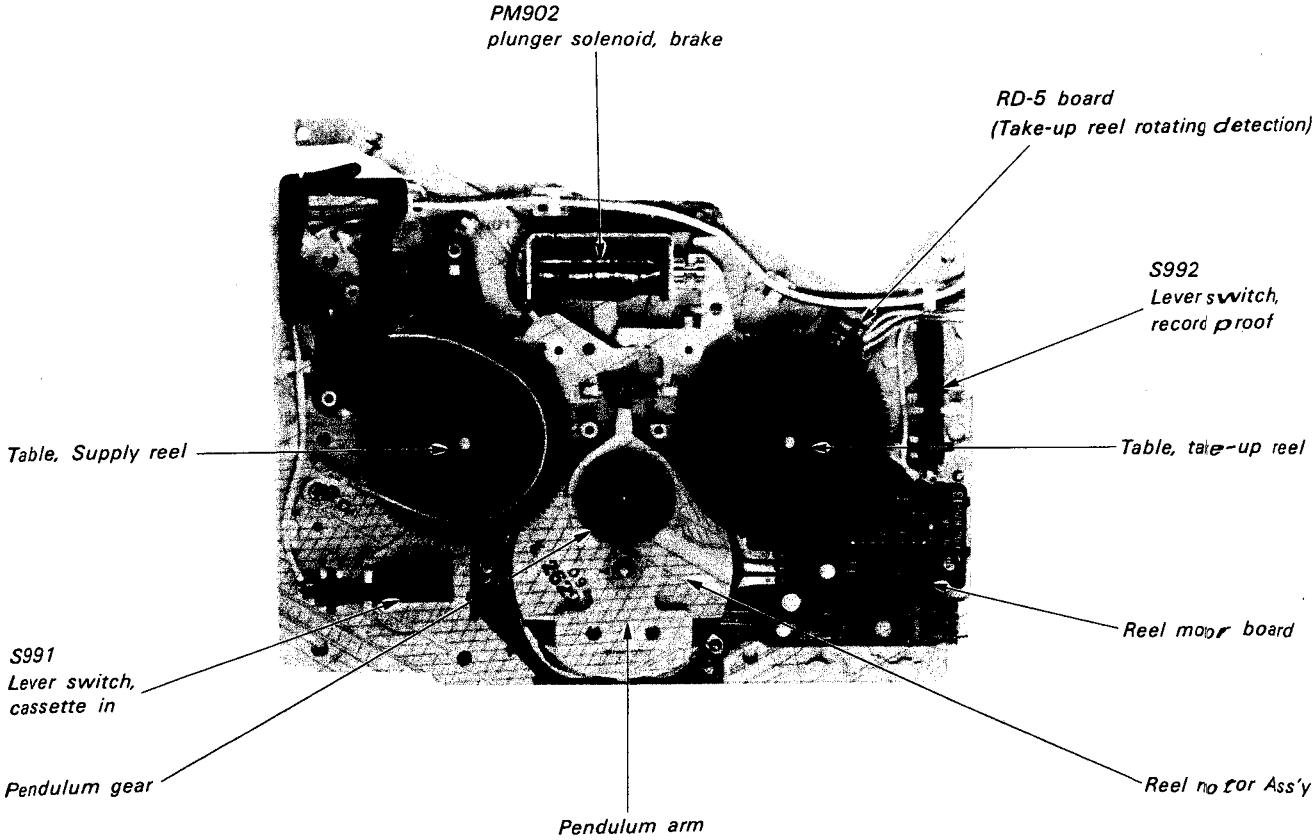
—Bottom side—


M902
Capstan motor Ass'y
M903
Reel motor Ass'y
M901
Drum motor Ass'y

—FL (Front Loading) cassette compartment Ass'y—

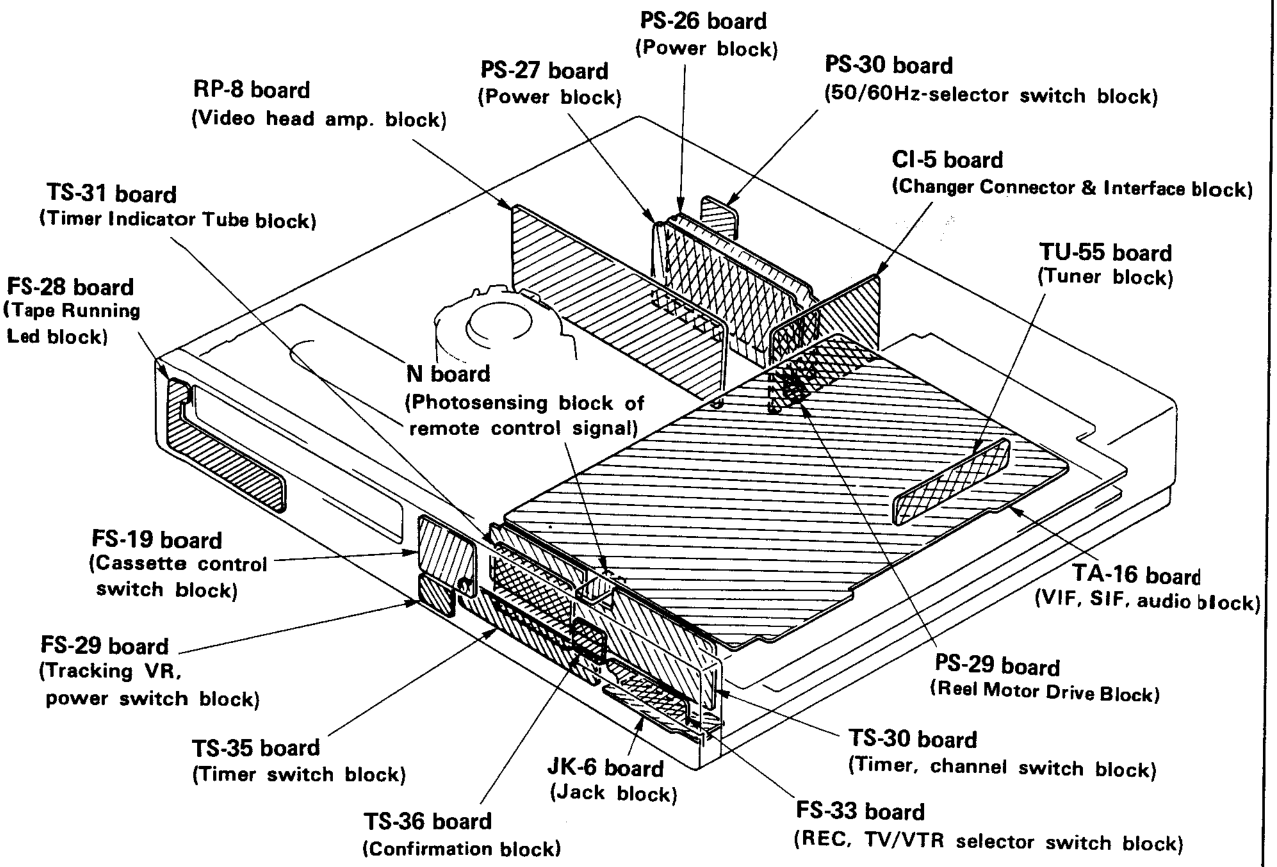

S302
Lever switch, cassette ON
S301
Lever switch, cassette OFF

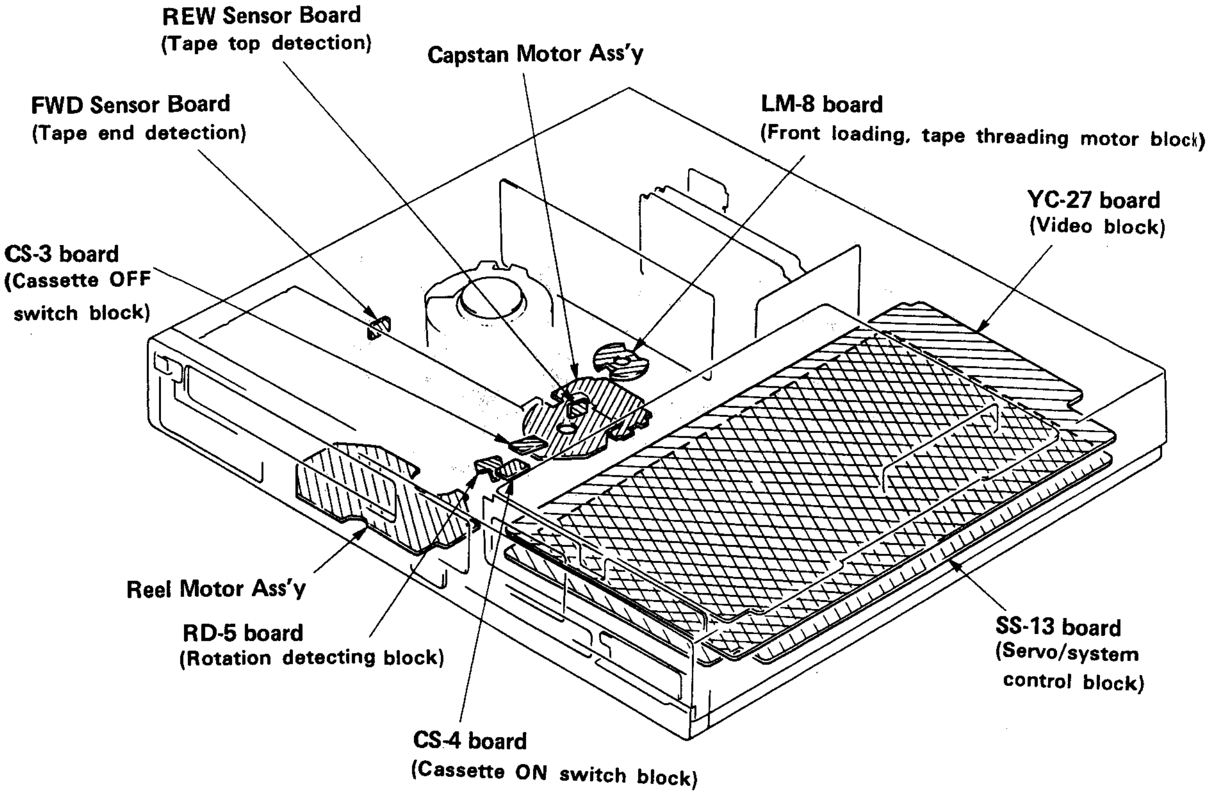
—Reel driving block—


PM902
plunger solenoid, brake
RD-5 board
(Take-up reel rotating detection)
S992
Lever switch,
record proof
Table, Supply reel
Table, take-up reel
Reel motor board
S991
Lever switch,
cassette in
Pendulum gear
Reel motor Ass'y
Pendulum arm

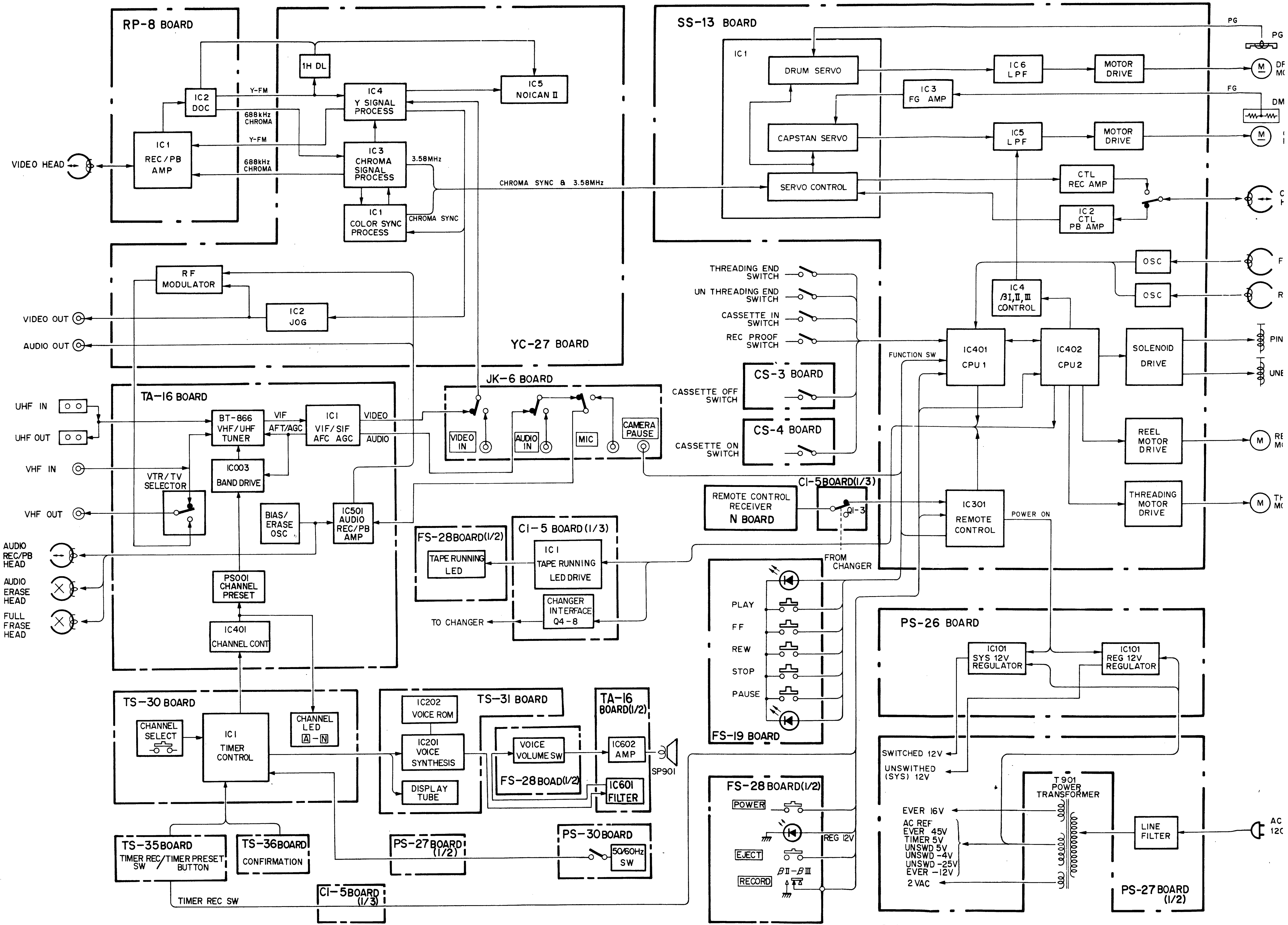
SECTION 3
DIAGRAMS

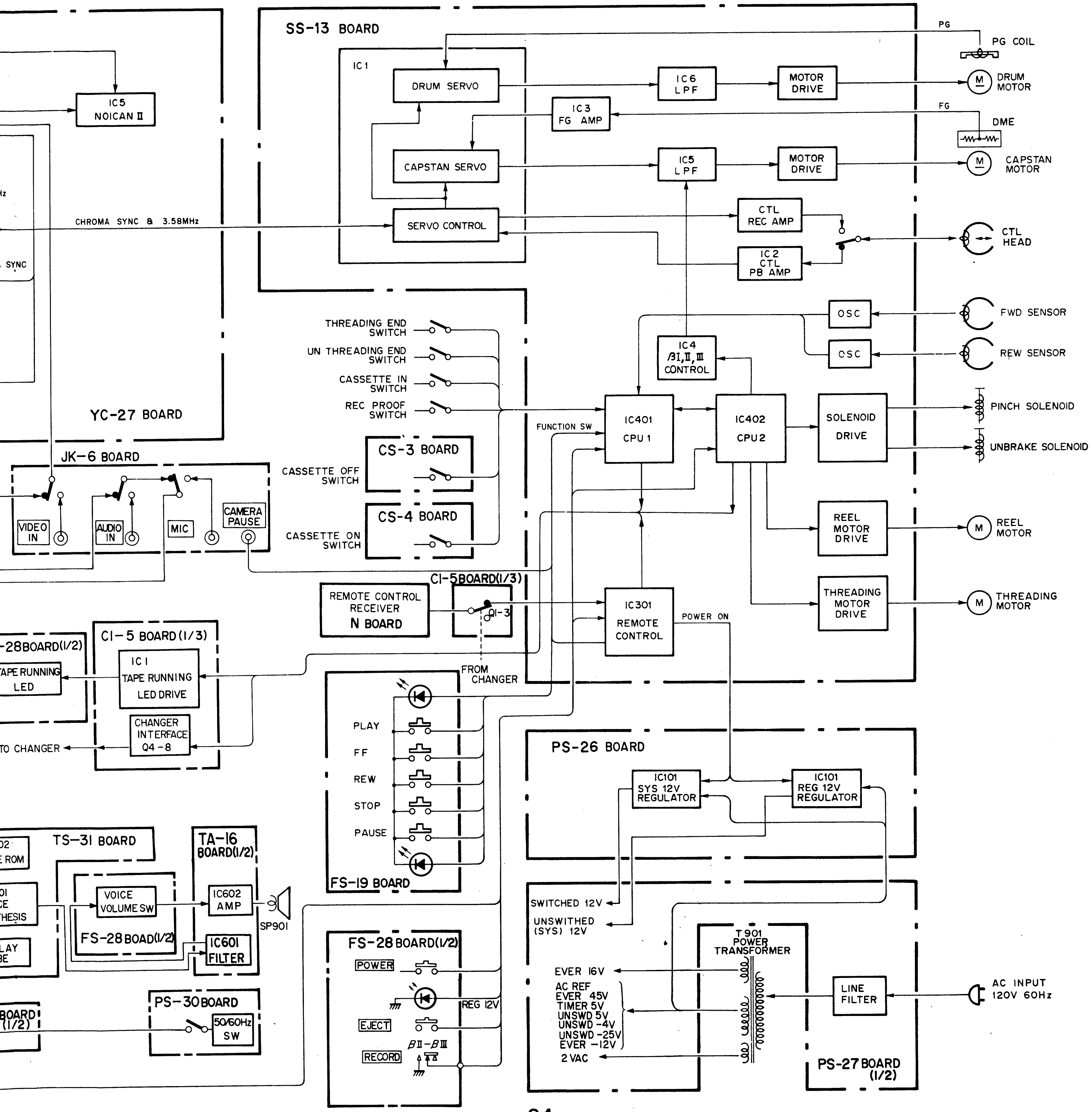
3-1. CIRCUIT BOARDS LOCATION


PS-26 board
(Power block)
PS-27 board
(Power block)
PS-30 board
(50/60Hz-selector switch block)
RP-8 board
(Video head amp. block)
CI-5 board
(Changer Connector & Interface block)
TS-31 board
(Timer Indicator Tube block)
TU-55 board
(Tuner block)
FS-28 board
(Tape Running
Led block)
N board
(Photosensing block of
remote control signal)
FS-19 board
(Cassette control
switch block)
TA-16 board
(VIF, SIF, audio block)
FS-29 board
(Tracking VR,
power switch block)
PS-29 board
(Reel Motor Drive Block)
TS-35 board
(Timer switch block)
TS-30 board
(Timer, channel switch block)
JK-6 board
(Jack block)
TS-36 board
(Confirmation block)
FS-33 board
(REC, TV/VTR selector switch block)

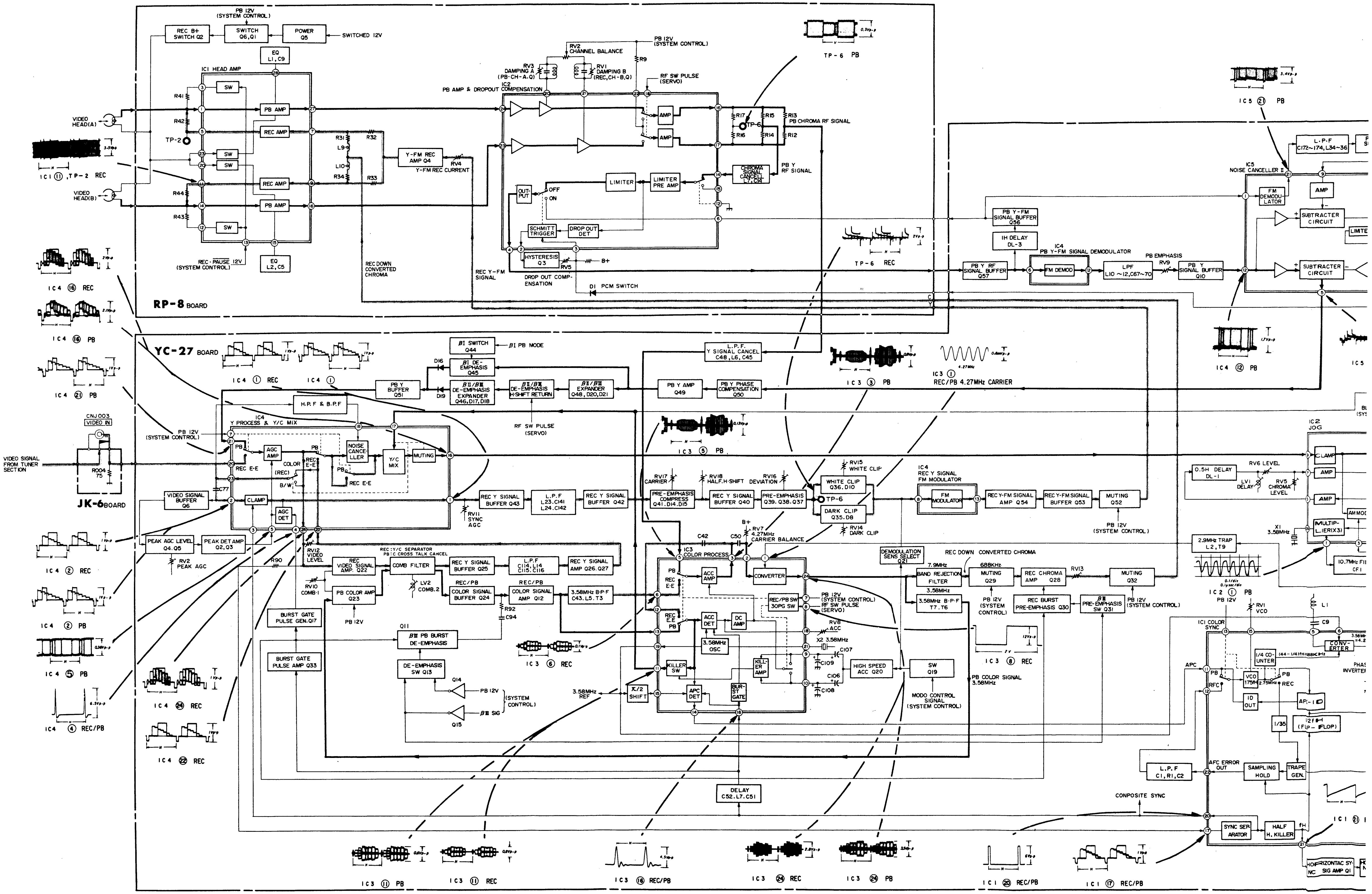

REW Sensor Board
(Tape top detection)
Capstan Motor Ass'y
FWD Sensor Board
(Tape end detection)
LM-8 board
(Front loading, tape threading motor block)
YC-27 board
(Video block)
CS-3 board
(Cassette OFF
switch block)
Reel Motor Ass'y
RD-5 board
(Rotation detecting block)
SS-13 board
(Servo/system
control block)
CS-4 board
(Cassette ON switch block)

3-2. OVERALL BLOCK DIAGRAM

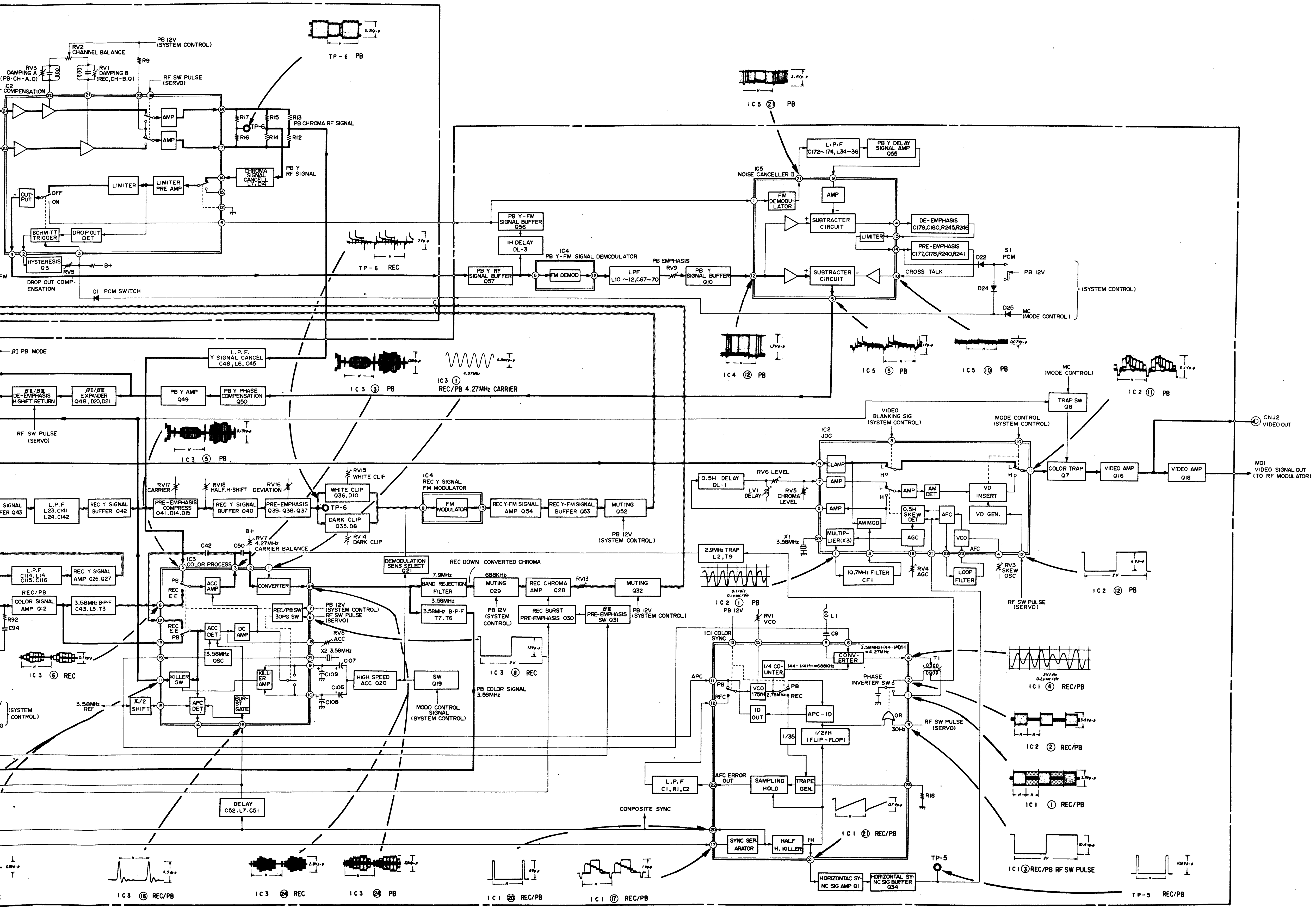

RP-8 BOARD
IC1 REC/PB AMP
IC2 DOC
VIDEO HEAD
Y-FM
688kHz CHROMA
1H DL
IC4 Y SIGNAL PROCESS
IC5 NOICAN II
IC3 CHROMA SIGNAL PROCESS
3.58MHz
IC1 COLOR SYNC PROCESS
CHROMA SYNC
CHROMA SYNC & 3.58MHz
RF MODULATOR
IC2 JOG
VIDEO OUT
AUDIO OUT
YC-27 BOARD
TA-16 BOARD
UHF IN
UHF OUT
VHF IN
VHF OUT
BT-866 VHF/UHF TUNER
VIF
AFT/AGC
IC1 VIF/SIF AFC AGC
VIDEO
AUDIO
IC003 BAND DRIVE
VTR/TV SELECTOR
BIAS/ERASE OSC
IC501 AUDIO REC/PB AMP
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
PS001 CHANNEL PRESET
IC401 CHANNEL CONT
JK-6 BOARD
VIDEO IN
AUDIO IN
MIC
CAMERA PAUSE
FS-28 BOARD (1/2)
TAPE RUNNING LED
CI-5 BOARD (1/3)
IC1 TAPE RUNNING LED DRIVE
CHANGER INTERFACE Q4-8
TO CHANGER
TS-30 BOARD
CHANNEL SELECT
IC1 TIMER CONTROL
CHANNEL LED A-N
TS-31 BOARD
IC202 VOICE ROM
IC201 VOICE SYNTHESIS
DISPLAY TUBE
VOICE VOLUME SW
FS-28 BOARD (1/2)
TA-16 BOARD (1/2)
IC602 AMP
IC601 FILTER
SP901
TS-35 BOARD
TIMER REC/SW
TIMER PRESET BUTTON
TS-36 BOARD
CONFIRMATION
PS-27 BOARD (1/2)
PS-30 BOARD
50/60Hz SW
CI-5 BOARD (1/3)
TIMER REC SW
SS-13 BOARD
IC1
DRUM SERVO
CAPSTAN SERVO
SERVO CONTROL
IC3 FG AMP
IC6 LPF
IC5 LPF
MOTOR DRIVE
MOTOR DRIVE
CTL REC AMP
IC2 CTL PB AMP
PG
FG
DM
OSC
OSC
THREADING END SWITCH
UN THREADING END SWITCH
CASSETTE IN SWITCH
REC PROOF SWITCH
CASSETTE OFF SWITCH
CASSETTE ON SWITCH
CS-3 BOARD
CS-4 BOARD
FUNCTION SW
IC4 βI, II, III CONTROL
IC401 CPU 1
IC402 CPU 2
SOLENOID DRIVE
PIN
UNE
REEL MOTOR DRIVE
THREADING MOTOR DRIVE
M
REMOTE CONTROL RECEIVER N BOARD
CI-5 BOARD (1/3)
QI-3
FROM CHANGER
IC301 REMOTE CONTROL
POWER ON
FS-19 BOARD
PLAY
FF
REW
STOP
PAUSE
PS-26 BOARD
IC101 SYS 12V REGULATOR
IC101 REG 12V REGULATOR
FS-28 BOARD (1/2)
POWER
EJECT
RECORD
βII-βIII
REG 12V
SWITCHED 12V
UNSWITHED (SYS) 12V
EVER 16V
AC REF
EVER 45V
TIMER 5V
UNSWD 5V
UNSWD -4V
UNSWD -25V
EVER -12V
2 VAC
T901 POWER TRANSFORMER
LINE FILTER
PS-27 BOARD (1/2)
AC 120


SS-13 BOARD
IC1
DRUM SERVO
IC6 LPF
MOTOR DRIVE
PG
PG COIL
DRUM MOTOR
IC3 FG AMP
FG
DME
CAPSTAN SERVO
IC5 LPF
MOTOR DRIVE
CAPSTAN MOTOR
IC5 NOICAN II
CHROMA SYNC & 3.58MHz
SERVO CONTROL
CTL REC AMP
IC2 CTL PB AMP
CTL HEAD
OSC
FWD SENSOR
OSC
REW SENSOR
IC4 βI,II,III CONTROL
SYNC
YC-27 BOARD
THREADING END SWITCH
UN THREADING END SWITCH
CASSETTE IN SWITCH
REC PROOF SWITCH
FUNCTION SW
IC401 CPU 1
IC402 CPU 2
SOLENOID DRIVE
PINCH SOLENOID
UNBRAKE SOLENOID
JK-6 BOARD
VIDEO IN
AUDIO IN
MIC
CAMERA PAUSE
CS-3 BOARD
CASSETTE OFF SWITCH
CS-4 BOARD
CASSETTE ON SWITCH
REEL MOTOR DRIVE
REEL MOTOR
CI-5 BOARD(1/3)
REMOTE CONTROL RECEIVER N BOARD
Q1-3
IC301 REMOTE CONTROL
POWER ON
THREADING MOTOR DRIVE
THREADING MOTOR
-28BOARD(1/2)
TAPE RUNNING LED
CI-5 BOARD (1/3)
IC1 TAPE RUNNING LED DRIVE
CHANGER INTERFACE Q4-8
TO CHANGER
FROM CHANGER
PLAY
FF
REW
STOP
PAUSE
FS-19 BOARD
PS-26 BOARD
IC101 SYS 12V REGULATOR
IC101 REG 12V REGULATOR
TS-31 BOARD
E ROM
VOICE VOLUME SW
FS-28 BOAD(1/2)
TA-16 BOARD(1/2)
IC602 AMP
IC601 FILTER
SP901
PS-30 BOARD
50/60Hz SW
BOARD (1/2)
FS-28 BOARD(1/2)
POWER
EJECT
RECORD
βII-βIII
REG 12V
SWITCHED 12V
UNSWITHED (SYS) 12V
EVER 16V
AC REF
EVER 45V
TIMER 5V
UNSWD 5V
UNSWD -4V
UNSWD -25V
EVER -12V
2 VAC
T901 POWER TRANSFORMER
LINE FILTER
PS-27 BOARD (1/2)
AC INPUT 120V 60Hz

3-3. VIDEO SYSTEM BLOCK DIAGRAM



PB 12V (SYSTEM CONTROL)
REC B+ SWITCH Q2
SWITCH Q6,Q1
POWER Q5
SWITCHED 12V
EQ L1,C9
IC1 HEAD AMP
VIDEO HEAD(A)
VIDEO HEAD(B)
TP-2
IC1 ⑪ ,TP-2 REC
SW
PB AMP
REC AMP
R41
R42
R43
R44
R31
R32
R33
R34
L9
L10
Y-FM REC AMP Q4
RV4 Y-FM REC CURRENT
REC·PAUSE 12V (SYSTEM CONTROL)
EQ L2,C5
REC DOWN CONVERTED CHROMA
REC Y-FM SIGNAL
RV2 CHANNEL BALANCE
RV3 DAMPING A (PB·CH-A,Q)
RV1 DAMPING B (REC,CH-B,Q)
IC2 PB AMP & DROPOUT COMPENSATION
PB 12V (SYSTEM CONTROL)
R9
RF SW PULSE (SERVO)
AMP
LIMITER
LIMITER PRE AMP
OUT-PUT
OFF
ON
SCHMITT TRIGGER
DROP OUT DET
HYSTERESIS Q3
RV5 DROP OUT COMP-ENSATION
B+
D1 PCM SWITCH
CHROMA SIGNAL CANCEL L7,C12
R17 R15 R13 TP-6 R16 R14 R12
PB CHROMA RF SIGNAL
PB Y RF SIGNAL
TP-6 PB
TP-6 REC
RP-8 BOARD
YC-27 BOARD
IC4 ① REC
IC4 ①
IC4 ⑯ REC
IC4 ⑯ PB
IC4 ㉑ PB
IC4 ② REC
IC4 ② PB
IC4 ⑤ PB
IC4 ④ REC/PB
IC4 ㉔ REC
IC4 ㉒ REC
CNJ003 VIDEO IN
VIDEO SIGNAL FROM TUNER SECTION
R004 75
JK-6 BOARD
βI SWITCH Q44
βI PB MODE
D16
βI DE-EMPHASIS Q45
PB Y BUFFER Q51
D19
βII/βIII DE-EMPHASIS EXPANDER Q46,D17,D18
βII/βIII DE-EMPHASIS H-SHIFT RETURN
βII/βIII EXPANDER Q48,D20,D21
H.P.F & B.P.F
IC4 Y PROCESS & Y/C MIX
PB 12V (SYSTEM CONTROL)
PB
AGC AMP
COLOR
REC E-E
(REC)
B/W
NOISE CANCELLER
Y/C MIX
MUTING
C77
VIDEO SIGNAL BUFFER Q6
CLAMP
AGC DET
PEAK AGC LEVEL Q4,Q5
PEAK DET AMP Q2,Q3
RV2 PEAK AGC
RV11 SYNC AGC
RV12 VIDEO LEVEL
RV10 COMB·1
REC Y SIGNAL BUFFER Q43
L.P.F L23,C141 L24,C142
REC Y SIGNAL BUFFER Q42
REC:Y/C SEPARATOR PB:C CROSS TALK CANCEL
REC VIDEO SIGNAL AMP. Q22
COMB FILTER
LV2 COMB.2
REC Y SIGNAL BUFFER Q25
L.P.F C114,L14 C115,C116
REC Y SIGNAL AMP Q26,Q27
R90
PB COLOR AMP Q23
REC/PB COLOR SIGNAL BUFFER Q24
REC/PB COLOR SIGNAL AMP Q12
3.58MHz B·P·F C43,L5,T3
R92
C94
PB 12V
BURST GATE PULSE GEN.Q17
BURST GATE PULSE AMP Q33
Q11 βIII PB BURST DE-EMPHASIS
DE-EMPHASIS SW Q13
Q14
Q15
PB 12V
βIII SIG
(SYSTEM CONTROL)
RF SW PULSE (SERVO)
L.P.F. Y SIGNAL CANCEL C48,L6,C45
PB Y AMP Q49
PB PHASE COMPENSATION Q50
IC3 ③ PB
IC3 ⑤ PB
IC3 ① REC/PB 4.27MHz CARRIER
RV17 CARRIER
RV18 HALF.H·SHIFT
RV16 DEVIATION
RV15 WHITE CLIP
PRE-EMPHASIS COMPRESS Q41,D14,D15
REC Y SIGNAL BUFFER Q40
PRE-EMPHASIS Q39,Q38,Q37
WHITE CLIP Q36,D10
TP-6
DARK CLIP Q35,D8
RV14 DARK CLIP
RV7 4.27MHz CARRIER BALANCE
C42
C50
B+
IC3 COLOR PROCESS
REC E·E
ACC AMP
CONVERTER
REC/PB SW 30PG SW
PB 12V (SYSTEM CONTROL)
RF SW PULSE (SERVO)
ACC DET
DC AMP
RV8 ACC
3.58MHz OSC
X2 3.58MHz
C107
C109
C106
C108
KILLER SW
KILLER AMP
APC DET
BURST GATE
π/2 SHIFT
3.58MHz REF
DELAY C52,L7,C51
HIGH SPEED ACC Q20
SW Q19
MODE CONTROL SIGNAL (SYSTEM CONTROL)
IC3 ⑥ REC
IC3 ⑪ PB
IC3 ⑪ REC
IC3 ⑯ REC/PB
IC3 ㉔ REC
IC3 ㉔ PB
DEMODULATION SENS SELECT Q21
REC DOWN CONVERTED CHROMA
7.9MHz BAND REJECTION FILTER Q29
688KHz MUTING Q32
REC CHROMA AMP Q28
RV13
MUTING Q32
3.58MHz B·P·F T7,T6
PB 12V (SYSTEM CONTROL)
REC BURST PRE-EMPHASIS Q30
βII PRE-EMPHASIS SW Q31
PB 12V (SYSTEM CONTROL)
IC3 ⑧ REC
PB COLOR SIGNAL 3.58MHz
IC4 REC Y SIGNAL FM MODULATOR
FM MODULATOR
REC Y-FM SIGNAL AMP Q54
REC Y-FM SIGNAL BUFFER Q53
MUTING Q52
PB 12V (SYSTEM CONTROL)
PB Y-FM SIGNAL BUFFER Q56
1H DELAY DL-3
IC4 PB Y-FM SIGNAL DEMODULATOR
PB Y RF SIGNAL BUFFER Q57
FM DEMOD
LPF L10~12,C67~70
PB EMPHASIS RV9
PB Y SIGNAL BUFFER Q10
IC5 NOISE CANCELLER II
FM DEMODULATOR
AMP
SUBTRACTER CIRCUIT
LIMITE
L·P·F C172~174,L34~36
IC5 ② PB
IC4 ⑫ PB
IC5
IC2 JOG
CLAMP
AMP
0.5H DELAY DL-1
RV6 LEVEL
LV1 DELAY
RV5 CHROMA LEVEL
X1 3.58MHz
MULTIPLIER(X3)
2.9MHz TRAP L2,T9
10.7MHz
IC2 ① PB
PB 12V
RV1 VCO
L1
C9
IC1 COLOR SYNC
APC
PB
RFC
1/4 COUNTER
VCO
PB
REC
ID OUT
CONVERTER
PHASE INVERTER
APC-ID
1/35
1/2 (FLIP-FLOP)
AFC ERROR OUT
SAMPLING HOLD
TRAPE GEN.
L.P.F C1,R1,C2
COMPOSITE SYNC
SYNC SEPARATOR
HALF H. KILLER
HORIZONTAL SYNC SIG AMP Q1
IC1 ⑳ REC/PB
IC1 ⑰ REC/PB
IC1 ㉑

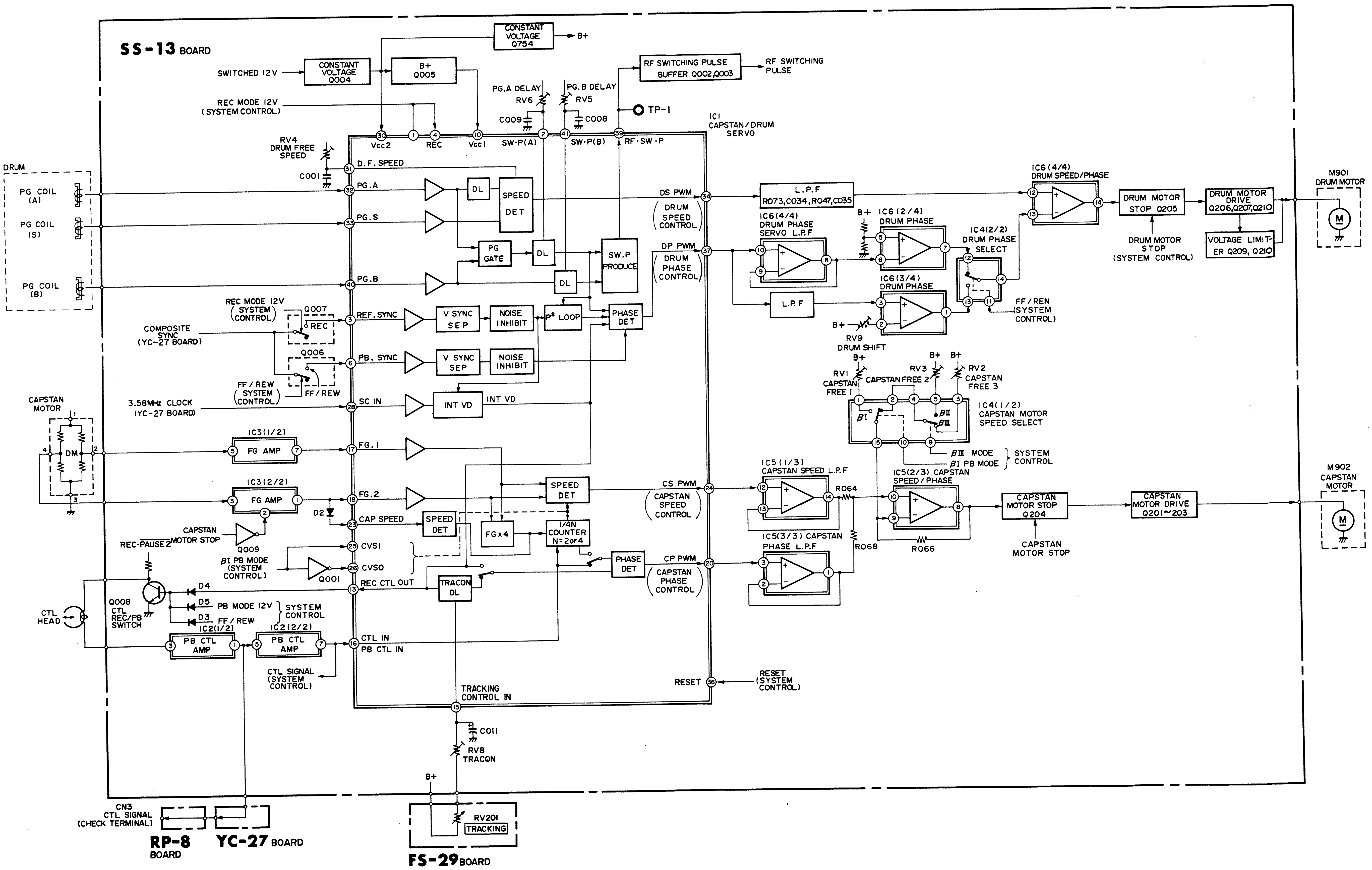

TP-6 PB
PB 12V (SYSTEM CONTROL)
RV2 CHANNEL BALANCE
RV3 DAMPING A (PB-CH-A,Q)
RV1 DAMPING B (REC,CH-B,Q)
IC2 COMPENSATION
RF SW PULSE (SERVO)
AMP
PB CHROMA RF SIGNAL
PB Y RF SIGNAL
CHROMA SIGNAL CANCEL L7,C14
LIMITER
LIMITER PRE AMP
OUTPUT
OFF
ON
SCHMITT TRIGGER
DROP OUT DET
HYSTERESIS Q3
DROP OUT COMPENSATION
D1 PCM SWITCH
TP-6 REC
IC5 ㉑ PB
L.P.F C172~174,L34~36
PB Y DELAY SIGNAL AMP Q55
IC5 NOISE CANCELLER II
FM DEMODULATOR
SUBTRACTER CIRCUIT
DE-EMPHASIS C179,C180,R245,R246
PRE-EMPHASIS C177,C178,R240,R241
CROSS TALK
S1 PCM
PB 12V
(SYSTEM CONTROL)
MC (MODE CONTROL)
PB Y-FM SIGNAL BUFFER Q56
1H DELAY DL-3
IC4 PB Y-FM SIGNAL DEMODULATOR
PB Y RF SIGNAL BUFFER Q57
FM DEMOD
LPF L10~12,C67~70
PB EMPHASIS RV9
PB Y SIGNAL BUFFER Q10
IC4 ⑫ PB
IC5 ⑤ PB
IC5 ⑩ PB
IC2 ⑪ PB
β1 PB MODE
L.P.F. Y SIGNAL CANCEL C48,L6,C45
βII/βIII DE-EMPHASIS H-SHIFT RETURN
βII/βIII EXPANDER Q48,D20,D21
PB Y AMP Q49
PB Y PHASE COMPENSATION Q50
IC3 ③ PB
IC3 ① REC/PB 4.27MHz CARRIER
RF SW PULSE (SERVO)
IC3 ⑤ PB
TRAP SW Q8
VIDEO BLANKING SIG (SYSTEM CONTROL)
MODE CONTROL (SYSTEM CONTROL)
IC2 JOG
CLAMP
0.5H DELAY DL-1
RV6 LEVEL
LV1 DELAY
RV5 CHROMA LEVEL
AM DET
AM MOD
VD INSERT
VD GEN.
0.5H SKEW DET
AFC
VCO
AGC
MULTIPLIER(X3)
X1 3.58MHz
10.7MHz FILTER CF1
RV4 AGC
LOOP FILTER
RV3 SKEW OSC
RF SW PULSE (SERVO)
COLOR TRAP Q7
VIDEO AMP Q16
VIDEO AMP Q18
CNJ2 VIDEO OUT
MO1 VIDEO SIGNAL OUT (TO RF MODULATOR)
IC2 ⑫ PB
RV17 CARRIER
RV18 HALF.H SHIFT
RV16 DEVIATION
RV15 WHITE CLIP
WHITE CLIP Q36,D10
DARK CLIP Q35,D8
RV14 DARK CLIP
TP-6
IC4 REC Y SIGNAL FM MODULATOR
FM MODULATOR
REC Y-FM SIGNAL AMP Q54
REC Y-FM SIGNAL BUFFER Q53
MUTING Q52
PB 12V (SYSTEM CONTROL)
L.P.F L23,C141 L24,C142
REC Y SIGNAL BUFFER Q42
PRE-EMPHASIS COMPRESS Q41,D14,D15
REC Y SIGNAL BUFFER Q40
PRE-EMPHASIS Q39,Q38,Q37
C42
C50
RV7 4.27MHz CARRIER BALANCE
IC3 COLOR PROCESS
CONVERTER
REC/PB SW 30PG SW
ACC AMP
ACC DET
DC AMP
3.58MHz OSC
KILLER SW
KILLER AMP
APC DET
BURST GATE
RV8 ACC
X2 3.58MHz
C107
C109
C106
C108
HIGH SPEED ACC Q20
SW Q19
MODE CONTROL SIGNAL (SYSTEM CONTROL)
PB COLOR SIGNAL 3.58MHz
DEMODULATION SENS SELECT Q21
REC DOWN CONVERTED CHROMA
7.9MHz BAND REJECTION FILTER
688KHz MUTING Q29
REC CHROMA AMP Q28
RV13
MUTING Q32
3.58MHz B.P.F T7,T6
REC BURST PRE-EMPHASIS Q30
βII PRE-EMPHASIS SW Q31
PB 12V (SYSTEM CONTROL)
IC3 ⑧ REC
L.P.F C114,L14 C115,C116
REC Y SIGNAL AMP Q26,Q27
REC/PB COLOR SIGNAL AMP Q12
3.58MHz B.P.F C43,L5,T3
R92
C94
IC3 ⑥ REC
3.58MHz REF
π/2 SHIFT
(SYSTEM CONTROL)
DELAY C52,L7,C51
2.9MHz TRAP L2,T9
IC2 ① PB
PB 12V
RV1 VCO
L1
C9
IC1 COLOR SYNC
CONVERTER
3.58MHz+(44-1/4)fH ≈ 4.27MHz
T1
PHASE INVERTER SW
APC
1/4 COUNTER
144-1/4(1fH)=688KHz
VCO 175fH
2.75MHz
ID OUT
APC-ID
1/35
1/2fH (FLIP-FLOP)
OR
30Hz
RF SW PULSE (SERVO)
IC1 ④ REC/PB
IC2 ② REC/PB
IC1 ① REC/PB
L.P.F C1,R1,C2
AFC ERROR OUT
SAMPLING HOLD
TRAPE GEN.
R18
COMPOSITE SYNC
SYNC SEPARATOR
HALF H. KILLER
fH
IC1 ㉑ REC/PB
TP-5
HORIZONTAL SYNC SIG AMP Q1
HORIZONTAL SYNC SIG BUFFER Q34
IC1 ③ REC/PB RF SW PULSE
TP-5 REC/PB
IC3 ⑯ REC/PB
IC3 ㉔ REC
IC3 ㉔ PB
IC1 ⑳ REC/PB
IC1 ⑰ REC/PB

- **Main signal channel**

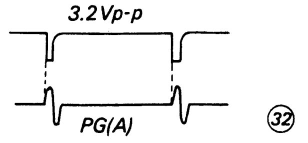
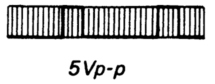
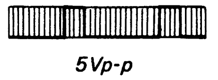
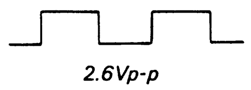
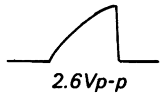
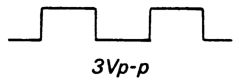
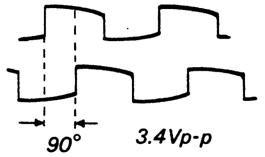
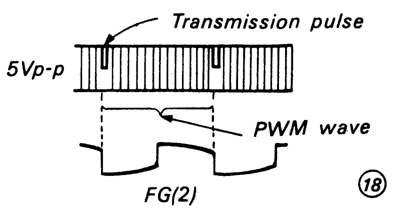
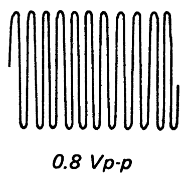
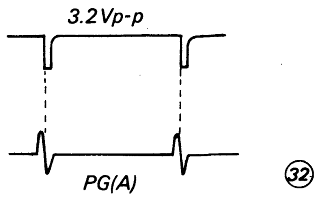
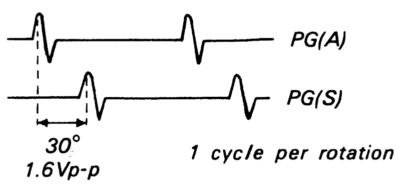
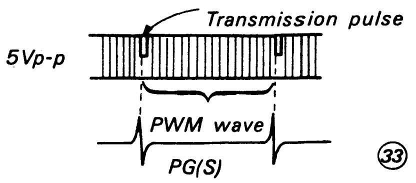
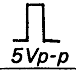
▨ **RECORD**

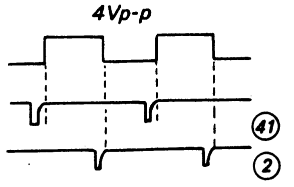
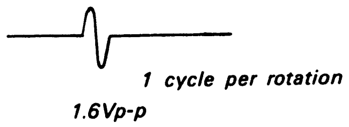
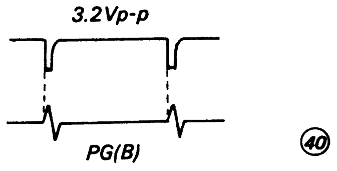
➡ **PLAYBACK**

3-4. SERVO SYSTEM BLOCK DIAGRAM

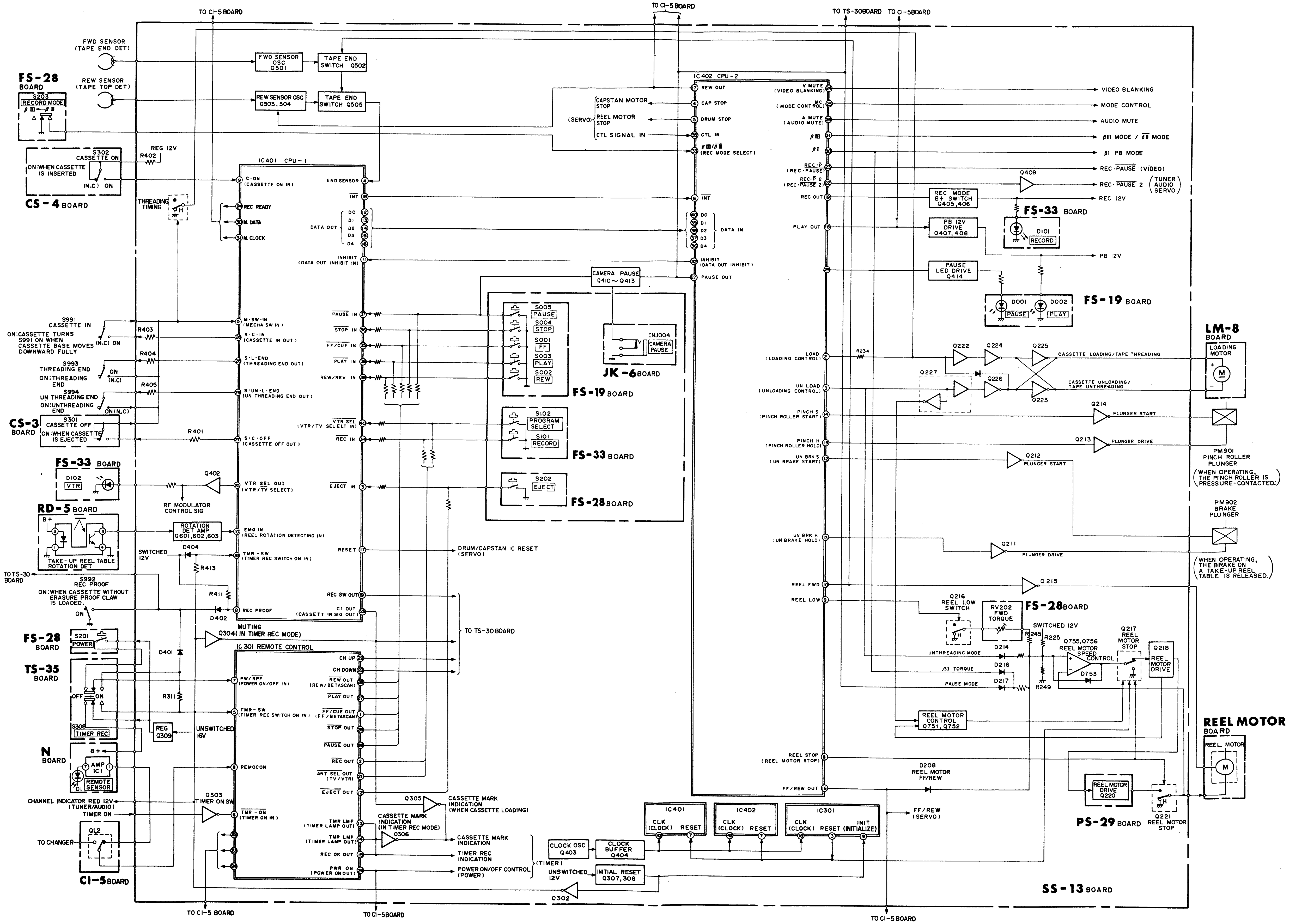

SS-13 BOARD
CONSTANT VOLTAGE Q754
B+
SWITCHED 12V
CONSTANT VOLTAGE Q004
B+ Q005
RF SWITCHING PULSE BUFFER Q002,Q003
RF SWITCHING PULSE
PG.A DELAY RV6
PG.B DELAY RV5
C009
C008
TP-1
REC MODE 12V (SYSTEM CONTROL)
IC1 CAPSTAN/DRUM SERVO
RV4 DRUM FREE SPEED
C001
Vcc2
REC
Vcc1
SW·P(A)
SW·P(B)
RF·SW·P
D.F. SPEED
DRUM
PG COIL (A)
PG COIL (S)
PG COIL (B)
PG.A
PG.S
PG.B
DL
SPEED DET
PG GATE
SW.P PRODUCE
DS PWM
DRUM SPEED CONTROL
DP PWM
DRUM PHASE CONTROL
REC MODE 12V (SYSTEM CONTROL)
Q007
REC
COMPOSITE SYNC (YC-27 BOARD)
REF. SYNC
V SYNC SEP
NOISE INHIBIT
P* LOOP
PHASE DET
Q006
PB. SYNC
FF/REW (SYSTEM CONTROL)
FF/REW
3.58MHz CLOCK (YC-27 BOARD)
SC IN
INT VD
CAPSTAN MOTOR
DM
IC3(1/2)
FG AMP
FG.1
IC3(2/2)
FG.2
SPEED DET
CS PWM
CAPSTAN SPEED CONTROL
D2
CAP SPEED
FG x 4
1/4N COUNTER N=2or4
CAPSTAN MOTOR STOP
REC·PAUSE
Q009
CVS1
βI PB MODE (SYSTEM CONTROL)
Q001
CVSO
REC CTL OUT
TRACON DL
PHASE DET
CP PWM
CAPSTAN PHASE CONTROL
Q008 CTL REC/PB SWITCH
D4
D5
PB MODE 12V
D3
FF/REW
SYSTEM CONTROL
CTL HEAD
IC2(1/2)
PB CTL AMP
IC2(2/2)
PB CTL AMP
CTL IN
PB CTL IN
CTL SIGNAL (SYSTEM CONTROL)
TRACKING CONTROL IN
RESET
RESET (SYSTEM CONTROL)
C011
RV8 TRACON
B+
RV201 TRACKING
CN3 CTL SIGNAL (CHECK TERMINAL)
RP-8 BOARD
YC-27 BOARD
FS-29 BOARD
L.P.F R073,C034,R047,C035
IC6(4/4) DRUM PHASE SERVO L.P.F
B+
IC6(2/4) DRUM PHASE
IC4(2/2) DRUM PHASE SELECT
FF/REN (SYSTEM CONTROL)
L.P.F
IC6(3/4) DRUM PHASE
B+
RV9 DRUM SHIFT
IC6(4/4) DRUM SPEED/PHASE
DRUM MOTOR STOP Q205
DRUM MOTOR STOP (SYSTEM CONTROL)
DRUM MOTOR DRIVE Q206,Q207,Q210
VOLTAGE LIMITER Q209, Q210
M901 DRUM MOTOR
RV1 CAPSTAN FREE 1
CAPSTAN FREE 2
RV3
RV2 CAPSTAN FREE 3
IC4(1/2) CAPSTAN MOTOR SPEED SELECT
βI
βII
βIII
βIII MODE
βI PB MODE
SYSTEM CONTROL
IC5(1/3) CAPSTAN SPEED L.P.F
R064
IC5(2/3) CAPSTAN SPEED/PHASE
R068
R066
IC5(3/3) CAPSTAN PHASE L.P.F
CAPSTAN MOTOR STOP Q204
CAPSTAN MOTOR STOP
CAPSTAN MOTOR DRIVE Q201~203
M902 CAPSTAN MOTOR

IC 1 **Digital servo IC (SS-13 Board)**

Terminal No.	I/O	Function and operation	Signal
1	Input	Changing-over signal in the REC mode	H: REC mode
2	Input	Time constant of RF switching pulse position	
3	Input	Composite signal input from the input video signal in the BETASCAN mode. In the BETASCAN mode (42-pin terminal "H") inside IC, the input controls the drum phase output to obtain the BETASCAN.	
4	Input	Input signal in the REC mode	H: REC mode
5	Input	Connected to GND.	
6	Input	Composite signal input from the PB video signal in the picture search mode. In the picture search mode (42-pin terminal "H") inside IC, the input controls the drum phase output to obtain the picture search.	
7	Input	Connected to B + power supply.	
8	Input	Connected to GND.	
9	Input	Connected to GND.	
10		Connected to B + power supply.	
11		Connected to GND.	
12	Output	Not used.	
13	Output	During REC, a composite signal from the input video signal is fed to a 3-pin terminal, and an REC CTL signal is generated and output using the vertical SYNC signal inside IC.	
14	Input	Connected to GND.	
15	Input	Tracking control time constant. During PB inside IC, the tracking control mono-multi output is a reference signal of the capstan phase servo.	
16	Input	PB CTL signal input in the PB mode. During PB, the input is a comparison signal of the capstan phase servo.	
17	Input	FG signal input from a capstan.	
18	Input	During REC, the input is a comparison signal of the capstan phase servo. During REC and PB, the input is a capstan speed servo signal.	
19	Output	Not used.	
20	Output	Capstan phase servo output	PWM wave 5Vp-p
21	Output	Not used.	
22	Output	Not used.	
23	Output	Capstan speed detecting	Goes "H" when a capstan motor starts rotating.
24	Output	Capstan speed servo output	
25	Input	Capstan speed changing-over input	H: βI L: βII, βIII
26	Input	Capstan speed changing-over input	L: βI H: βII, βIII
27	Output	Not used.	
28	Input	3.58 MHz-signal input from crystal oscillation. During PB, the input is a reference signal (INT VD) of the drum phase servo by counting down the 3.58 MHz-signal.	
29		Connected to GND	
30		Connected to B + power supply	
31	Input	Drum speed PG (A) time constant	
32	Input	PG(A) signal input from rotation of a drum	
33	Input	PG(S) signal input from rotation of a drum During REC and PB, the input is a drum speed servo signal.	
34	Output	Drum speed servo output	
35		Connected to GND.	
36	Input	Reset input A pulse is input when the power switch is turned "ON".	 : During power ON 5Vp-p
37	Output	Drum phase servo output	PWM wave 5Vp-p
38	Output	Not used.	

39	Output	RF switching pulse output	
40	Input	PG(B) signal input from rotation of a drum During REC and PB, the input is a comparison signal of the drum phase servo.	
41	Input	Time constant of RF switching pulse position	
42	Input	"H" is input in the BETASCAN mode. A AFC circuit inside IC goes high. (f_H deviation compensating) The drum phase output from a 37-pin terminal is controlled by input of a 6-pin terminal.	H: BETASCAN mode

3-5. SYSTEM CONTROL BLOCK DIAGRAM (1)



TO CI-5 BOARD
TO TS-30 BOARD
FWD SENSOR (TAPE END DET)
REW SENSOR (TAPE TOP DET)
FS-28 BOARD
S203 RECORD MODE
FWD SENSOR OSC Q501
TAPE END SWITCH Q502
REW SENSOR OSC Q503,504
TAPE END SWITCH Q505
S302 CASSETTE ON
ON: WHEN CASSETTE IS INSERTED
CS-4 BOARD
REG 12V
R402
THREADING TIMING
IC401 CPU-1
C-ON (CASSETTE ON IN)
END SENSOR
INT
REC READY
M. DATA
M. CLOCK
DATA OUT
D0 D1 D2 D3 D4
INHIBIT (DATA OUT INHIBIT IN)
IC402 CPU-2
REW OUT
CAP STOP
DRUM STOP
CTL IN
REC MODE SELECT
CAPSTAN MOTOR STOP
REEL MOTOR STOP
(SERVO)
CTL SIGNAL IN
DATA IN
PAUSE OUT
CAMERA PAUSE Q410~Q413
V MUTE (VIDEO BLANKING)
MC (MODE CONTROL)
A MUTE (AUDIO MUTE)
REC·P (REC·PAUSE)
REC·P 2 (REC·PAUSE 2)
REC OUT
PLAY OUT
VIDEO BLANKING
MODE CONTROL
AUDIO MUTE
βIII MODE / βII MODE
βI PB MODE
REC·PAUSE (VIDEO)
REC·PAUSE 2 (TUNER AUDIO SERVO)
REC 12V
PB 12V
Q409
REC MODE B+ SWITCH Q405,406
PB 12V DRIVE Q407,408
FS-33 BOARD
D101 RECORD
PAUSE LED DRIVE Q414
D001 PAUSE
D002 PLAY
FS-19 BOARD
S005 PAUSE
S004 STOP
S001 FF
S003 PLAY
S002 REW
FS-19 BOARD
CNJ004 CAMERA PAUSE
JK-6 BOARD
S102 PROGRAM SELECT
S101 RECORD
FS-33 BOARD
S202 EJECT
FS-28 BOARD
S991 CASSETTE IN
ON: CASSETTE TURNS S991 ON WHEN CASSETTE BASE MOVES DOWNWARD FULLY
S993 THREADING END
ON: THREADING END
S994 UN THREADING END
ON: UNTHREADING END
S301 CASSETTE OFF
ON: WHEN CASSETTE IS EJECTED
CS-3 BOARD
R403 R404 R405 R401
M·SW·IN (MECHA SW IN)
S·C·IN (CASSETTE IN OUT)
S·L·END (THREADING END OUT)
S·UN·L·END (UN THREADING END OUT)
S·C·OFF (CASSETTE OFF OUT)
PAUSE IN
STOP IN
FF/CUE IN
PLAY IN
REW/REV IN
VTR SEL (VTR/TV SELECT IN)
REC IN
EJECT IN
FS-33 BOARD
D102 VTR
Q402
VTR SEL OUT (VTR/TV SELECT)
RF MODULATOR CONTROL SIG
RD-5 BOARD
TAKE-UP REEL TABLE ROTATION DET
ROTATION DET AMP Q601,602,603
EMG IN (REEL ROTATION DETECTING IN)
SWITCHED 12V
D404
R413
TMR·SW (TIMER REC SWITCH ON IN)
RESET
DRUM/CAPSTAN IC RESET (SERVO)
TO TS-30 BOARD
S992 REC PROOF
ON: WHEN CASSETTE WITHOUT ERASURE PROOF CLAW IS LOADED.
R411
D402
REC PROOF
REC SW OUT
CI OUT (CASSETT IN SIG OUT)
TO TS-30 BOARD
MUTING Q304 (IN TIMER REC MODE)
FS-28 BOARD
S201 POWER
TS-35 BOARD
S306 TIMER REC
D401
R311
REG Q309
UNSWITCHED 16V
IC301 REMOTE CONTROL
PW/RPF (POWER ON/OFF IN)
TMR-SW (TIMER REC SWITCH ON IN)
REMOCON
CH UP
CH DOWN
REW OUT (REW/BETASCAN)
PLAY OUT
FF/CUE OUT (FF/BETASCAN)
STOP OUT
PAUSE OUT
REC OUT
ANT SEL OUT (TV/VTR)
EJECT OUT
TMR LMP (TIMER LAMP OUT)
REC OK OUT
PWR ON (POWER ON OUT)
N BOARD
AMP IC1
REMOTE SENSOR
D1
CHANNEL INDICATOR RED 12V (TUNER/AUDIO)
TIMER ON
Q303 TIMER ON SW
TMR-ON (TIMER ON IN)
TO CHANGER
OL2
CI-5 BOARD
Q305
CASSETTE MARK INDICATION (WHEN CASSETTE LOADING)
CASSETTE MARK INDICATION (IN TIMER REC MODE)
Q306
CASSETTE MARK INDICATION
TIMER REC INDICATION
POWER ON/OFF CONTROL (POWER)
(TIMER)
CLOCK OSC Q403
CLOCK BUFFER Q404
UNSWITCHED 12V
INITIAL RESET Q307,308
Q302
IC401 CLK (CLOCK) RESET
IC402 CLK (CLOCK) RESET
IC301 CLK (CLOCK) RESET INIT (INITIALIZE)
FF/REW (SERVO)
LOAD (LOADING CONTROL)
UN LOAD (UNLOADING CONTROL)
PINCH S (PINCH ROLLER START)
PINCH H (PINCH ROLLER HOLD)
UN BRK S (UN BRAKE START)
UN BRK H (UN BRAKE HOLD)
REEL FWD
REEL LOW
REEL STOP (REEL MOTOR STOP)
FF/REW OUT
R234
Q222 Q224 Q225 Q226 Q227 Q223
CASSETTE LOADING/TAPE THREADING
CASSETTE UNLOADING/TAPE UNTHREADING
LM-8 BOARD
LOADING MOTOR
Q214 PLUNGER START
Q213 PLUNGER DRIVE
Q212 PLUNGER START
PM901 PINCH ROLLER PLUNGER
(WHEN OPERATING, THE PINCH ROLLER IS PRESSURE-CONTACTED.)
PM902 BRAKE PLUNGER
Q211 PLUNGER DRIVE
(WHEN OPERATING, THE BRAKE ON A TAKE-UP REEL TABLE IS RELEASED.)
Q215
Q216 REEL LOW SWITCH
RV202 FWD TORQUE
FS-28 BOARD
SWITCHED 12V
R245 R225 R249
UNTHREADING MODE
βI TORQUE
PAUSE MODE
D214 D216 D217
Q755,Q756 REEL MOTOR SPEED CONTROL
D753
Q217 REEL MOTOR STOP
Q218 REEL MOTOR DRIVE
REEL MOTOR CONTROL Q751,Q752
REEL MOTOR BOARD
REEL MOTOR
D208 REEL MOTOR FF/REW
REEL MOTOR DRIVE Q220
PS-29 BOARD
Q221 REEL MOTOR STOP
SS-13 BOARD
TO CI-5 BOARD

3-6. SYSTEM CONTROL BLOCK DIAGRAM (2)

Flow of signal

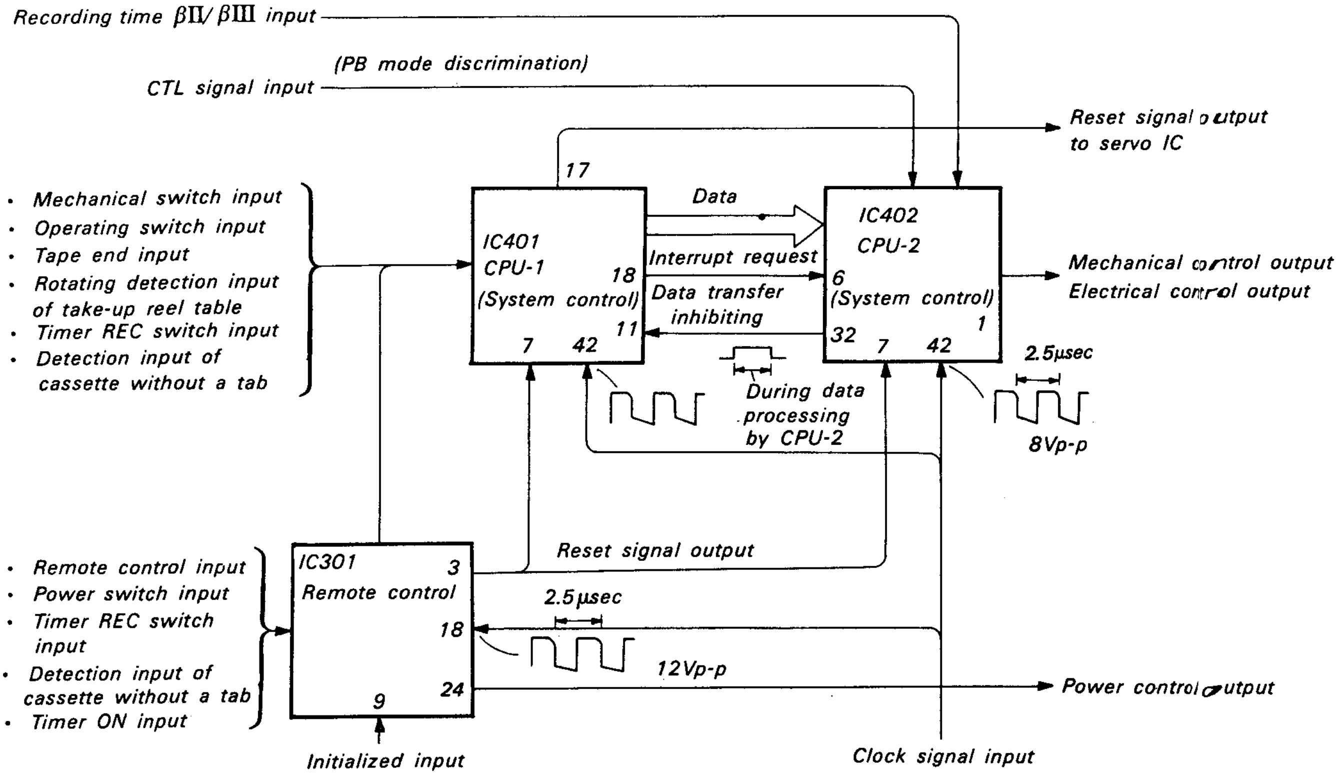
Operation of the system control requires that,
During power OFF

- Power supply is fed to the power terminals (⑲ , ⑳) of a remote control IC (IC301).
- A clock signal is add to the clock input terminal (⑱) of a remote control IC (IC301).
- The initialized input terminal (⑨) of a remote control IC (IC301) is "L" in level. (The input terminal is initialized using a pulse_/‾L_ during connection of a power code.)
- Under the condition described above, power supply, IC401 and IC402 are controlled by the input signal of a remote control IC.

During power ON

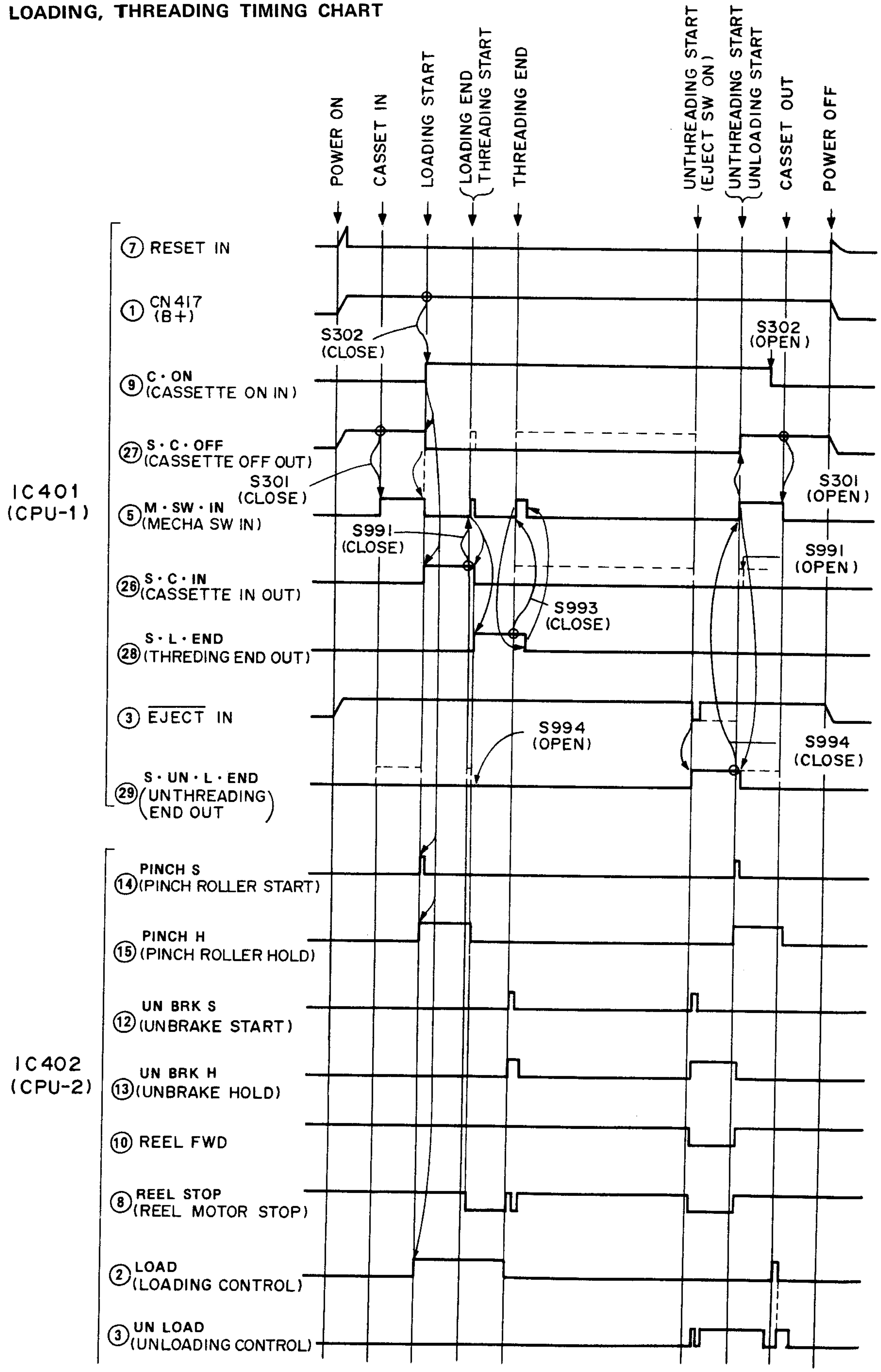
- Power supply is fed to the power terminals (⑳ , ㉑) of system control ICs (IC401, IC402).
- A clock signal is added to the clock input terminal (㊷) of system control ICs (IC401, IC402).
- The reset input terminal (⑦) of system control ICs (IC401, IC402) is "L" in level. (The input terminal is reset using a pulse _⎍_ through IC301 during power ON.)
- The interrupt request input terminal (⑥) of a system control IC (IC402) is high in level and each pressing of an operating switch causes the input of a negative pulse (‾⊤‾).
- The data transfer inhibiting output terminal (㉜) of a system control IC (IC402) is low in level and IC401 is in the data output mode.
- Under the condition described above, an interrupt request pulse and data are fed from IC401 to IC402 according to each input, and then each control output is fed from IC402.
- Data transmission of CPU-1 (IC401) to CPU-2 (IC402)

Data / **Mode**	**Data input terminal of IC402**				
	㊵	㊴	㊳	㊲	㊱
PB	L	H	H	H	H
REC	L	L	L	H	H
FF	L	L	H	H	H
REW	H	L	H	H	H
BETASCAN (▶▶)	L	H	L	H	H
BETASCAN (◀◀)	H	H	L	H	H
STOP	H	H	L	L	H
PB PAUSE	H	H	H	H	H
REC PAUSE	H	L	L	H	H
Front loading	L	L	H	L	H
Threading	H	L	H	L	H
Unthreading	H	H	H	L	H
Unloading	L	H	H	L	H
BETA SKIPSCAN (When an FF button is pressed in the FF mode)	L	H	L	H	H
BETA SKIPSCAN (When a REW button is pressed in the REW mode)	H	H	L	H	H

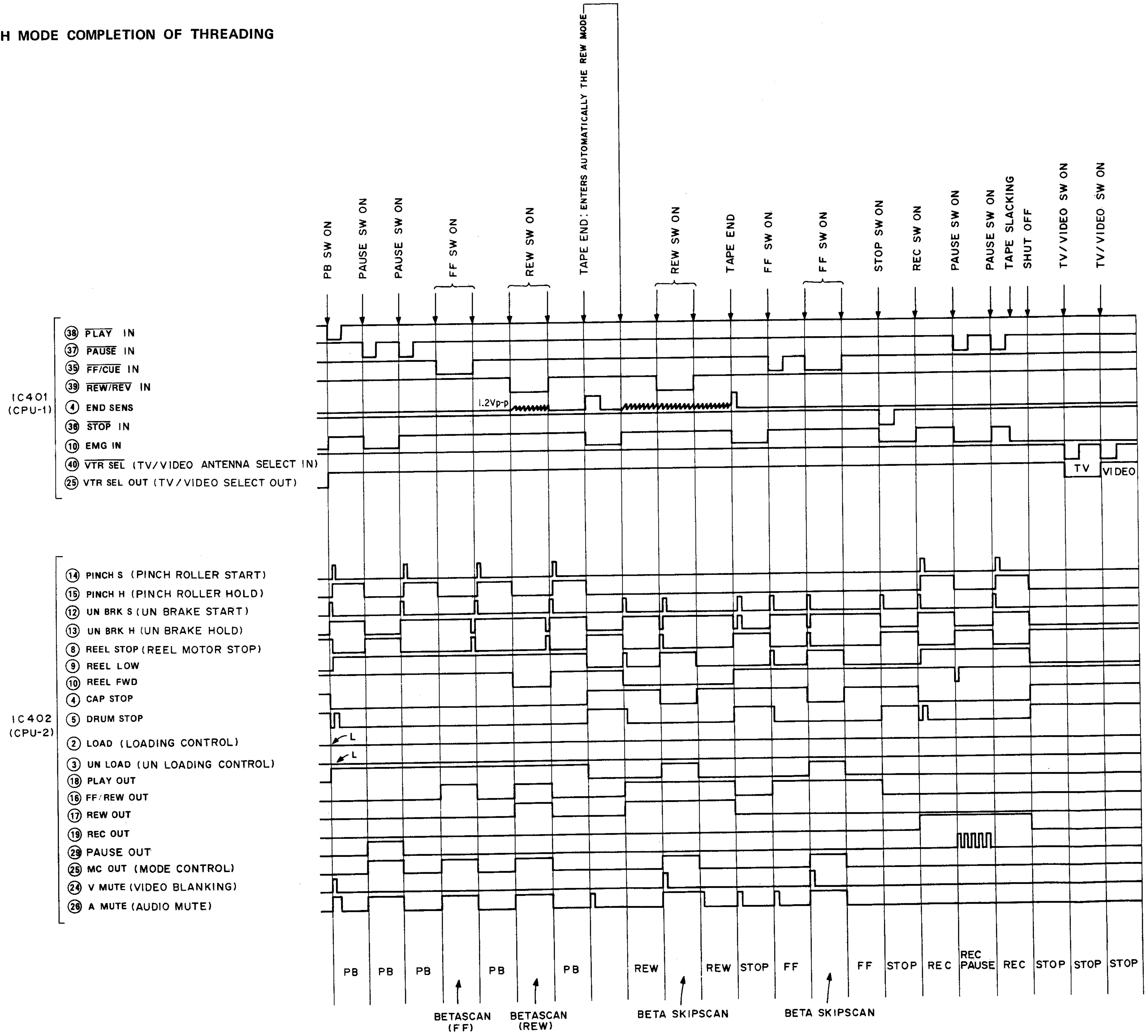


Recording time βII/βIII input
(PB mode discrimination)
CTL signal input
Reset signal output to servo IC
17
• Mechanical switch input
• Operating switch input
• Tape end input
• Rotating detection input of take-up reel table
• Timer REC switch input
• Detection input of cassette without a tab
IC401
CPU-1
(System control)
18
11
7
42
Data
Interrupt request
Data transfer inhibiting
IC402
CPU-2
(System control)
6
32
7
42
1
Mechanical control output
Electrical control output
During data processing by CPU-2
2.5μsec
8Vp-p
• Remote control input
• Power switch input
• Timer REC switch input
• Detection input of cassette without a tab
• Timer ON input
IC301
Remote control
3
18
24
9
Reset signal output
2.5μsec
12Vp-p
Power control output
Initialized input
Clock signal input

3-7. LOADING, THREADING TIMING CHART


POWER ON
CASSET IN
LOADING START
LOADING END
THREADING START
THREADING END
UNTHREADING START
(EJECT SW ON)
UNTHREADING START
UNLOADING START
CASSET OUT
POWER OFF
IC401
(CPU-1)
⑦ RESET IN
① CN417 (B+)
S302 (CLOSE)
S302 (OPEN)
⑨ C · ON (CASSETTE ON IN)
㉗ S · C · OFF (CASSETTE OFF OUT)
S301 (CLOSE)
S301 (OPEN)
⑤ M · SW · IN (MECHA SW IN)
S991 (CLOSE)
S991 (OPEN)
㉖ S · C · IN (CASSETTE IN OUT)
S993 (CLOSE)
S · L · END
㉘ (THREDING END OUT)
③ EJECT IN
S994 (OPEN)
S994 (CLOSE)
S · UN · L · END
㉙ (UNTHREADING END OUT)
IC402
(CPU-2)
PINCH S
⑭ (PINCH ROLLER START)
PINCH H
⑮ (PINCH ROLLER HOLD)
UN BRK S
⑫ (UNBRAKE START)
UN BRK H
⑬ (UNBRAKE HOLD)
⑩ REEL FWD
⑧ REEL STOP (REEL MOTOR STOP)
② LOAD (LOADING CONTROL)
③ UN LOAD (UNLOADING CONTROL)

3-8. TIMING CHART IN EACH MODE COMPLETION OF THREADING

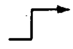
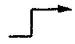
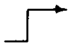
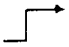
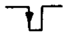
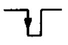
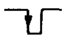
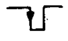
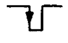
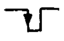
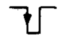
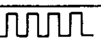

PB SW ON
PAUSE SW ON
PAUSE SW ON
FF SW ON
REW SW ON
TAPE END: ENTERS AUTOMATICALLY THE REW MODE
REW SW ON
TAPE END
FF SW ON
FF SW ON
STOP SW ON
REC SW ON
PAUSE SW ON
PAUSE SW ON
TAPE SLACKING
SHUT OFF
TV/VIDEO SW ON
TV/VIDEO SW ON
IC401
(CPU-1)
㊳ PLAY IN
㊲ PAUSE IN
㉟ FF/CUE IN
㊴ REW/REV IN
④ END SENS
㊱ STOP IN
⑩ EMG IN
㊵ VTR SEL (TV/VIDEO ANTENNA SELECT IN)
㉕ VTR SEL OUT (TV/VIDEO SELECT OUT)
1.2Vp-p
TV
VIDEO
IC402
(CPU-2)
⑭ PINCH S (PINCH ROLLER START)
⑮ PINCH H (PINCH ROLLER HOLD)
⑫ UN BRK S (UN BRAKE START)
⑬ UN BRK H (UN BRAKE HOLD)
⑧ REEL STOP (REEL MOTOR STOP)
⑨ REEL LOW
⑩ REEL FWD
④ CAP STOP
⑤ DRUM STOP
② LOAD (LOADING CONTROL)
③ UN LOAD (UN LOADING CONTROL)
⑱ PLAY OUT
⑯ FF/REW OUT
⑰ REW OUT
⑲ REC OUT
㉙ PAUSE OUT
㉕ MC OUT (MODE CONTROL)
㉔ V MUTE (VIDEO BLANKING)
㉖ A MUTE (AUDIO MUTE)
L
L
PB
PB
PB
PB
PB
REW
REW
STOP
FF
FF
STOP
REC
REC PAUSE
REC
STOP
STOP
STOP
BETASCAN (FF)
BETASCAN (REW)
BETA SKIPSCAN
BETA SKIPSCAN

- **Input/output terminal of remote control IC (IC301)**

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	$\overline{\text{FF/CUE}}$	FF/BETASCAN mode	Output	Output when sensing the FF/BETASCAN signal from a remote controller.	⊔
2	$\overline{\text{REC}}$	REC mode	Output	Output when sensing the REC signal from a remote controller. Outputs "L" for one second at the set time of a timer in the timer REC mode.	⊔
3	RESET	Reset	Output	Outputs a pulse every time the power switch is turned ON/OFF.	⊓
4	Vdd	Power terminal	——	Grounding	
5	TMR-SW	Timer REC mode	Input	When a TIMER REC switch is turned ON, "H" is input. Input of a 7-pin terminal is active-low.	↑
6	$\overline{\text{TMR-ON}}$	Timer ON	Input	Inputs "L" at the set time of a timer in the TIMER REC mode.	↓
7	PWR/$\overline{\text{RPF}}$	Power ON/OFF	Input	ON/OFF signal input using a power switch. Cassette tab signal input during TIMER REC switch ON ("L": tab provided, "H": tab not provided). When input of a 5-pin terminal is "L", active-high, and when "H", active-low.	⊓ : Active-high input during power switch ON. ↓ : Active-low input during TIMER REC.
8	REMOCON	Remote control	Input	Remote control serial data input from the sensing block	Serial data
9	INIT	Initializing	Input	Initializes the inside of IC during connection of a power cord.	⊓
10	N・C	————	——	Not used.	
11	————	————	——	Not used.	
12	$\overline{\text{EJECT}}$	Unloading of cassette without a tab	Output	Output when a TIMER REC switch is turned "ON" with the cassette without a tab loaded (7-pin terminal "H").	↓
13	TMR-LMP	Cassette display	Output	Output when a TIMER REC switch is turned "ON".	↑
14	TMR-LMP	Cassette display	Output	Output when a TIMER REC switch is turned "ON".	⊓⊔⊓⊔: When a cassette and tab are not provided
15	REC OK	REC OK display	Output	Output when a TIMER REC switch is turned "ON".	↑
16	————	————	——	Not used.	
17	————	————	——	Not used.	
18	CLK IN	External clock	Input	400 kHz-clock signal input	⊓⊔⊓⊔⊓
19	————	————	——	Connected to Vss.	
20	Vss	Power terminal	——	B + power supply 12V	
21	$\overline{\text{ANT SEL}}$	Video/TV antenna selecting	Output	Output when sensing the VTR/TV antenna changing-over signal.	⊔
22	————	————	——	Not used.	
23	————	————	——	Not used.	
24	PWR ON	Power ON	Output	When input of a power switch, TIMER REC switch and timer is turned ON, the power output is turned ON/OFF.	↑ : Power ON ↓ : Power OFF
25	$\overline{\text{STOP}}$	STOP mode	Output	Output when sensing the stop signal from a remote controller. Output for one second during power OFF.	⊔
26	$\overline{\text{PAUSE}}$	PAUSE mode	Output	Output when sensing the pause signal from a remote controller.	⊔
27	$\overline{\text{PLAY}}$	PB mode	Output	Output when sensing the PB signal from a remote controller.	⊔
28	$\overline{\text{REW/REV}}$	REW/BETASCAN mode	Output	Output when sensing the REW/BETASCAN signal from a remote controller.	⊔

- **Input/output terminal of system control IC (IC401)**

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	————	————	——	Not used.	
2	————	————	——		
3	$\overline{\text{EJECT}}$	Cassette ejecting	Input	Input when a cassette eject button is pressed. Input when a TIMER REC switch is turned "ON" with the cassette without a tab loaded.	⊔
4	END SENS	Tape end	Input "H"=more than 8.5V "L"=less than 4.0V	Input at tape end. Goes "L" when the tape is running in the FWD directionand goes "H" at tape end. Inputs a sawtooth wave (5 μsec) when the tape is running in the reverse direction. Goes "H" to enter the STOP mode at tape top.	↑ : Tape end ΛΛΛΛ↑ : Tape top 5μsec 1.2Vp-p
5	M・SW IN	Mechanical switch	Input	During loading, threading, unloading and unthreading, CPU-1 enters each mode by using a mechanical switch.	↑ ↓
6	TEST			Not used.	
7	RESET	Reset	Input	Inputs to initialize CPU-1. A pulse is input every time the power switch is turned ON/OFF.	⊓
8	REC PROOF	Record proof	Input	Goes "H" when the cassette without a tab is loaded. At that time, the cassette is ejected when a REC switch is turned ON.	H: cassette without a tab L: cassette with a tab
9	C・ON	Cassette ON	Input	Cassette ON is input to CPU-1 during insertion of a cassette.	↑
10	EMG IN	T-reel rotation	Input	EMG IN is input to CPU-1 during rotation of a T-reel (take-up reel) table. Enters the STOP mode when the EMG input goes from "H" to "L" during PB and REC. At that time, no switch except the EJECT switch is put to use.	H: when rotating L: when not rotating
11	INHIBIT	Data output inhibiting	Input	CPU-2 goes "H" during processing of data. At that time, input to inhibit output of the new data from CPU-1.	H: new data output inhibiting
12	D0	Data	Output	Fed to CPU-2, as data, according to input of an operating switch, mechanical switch, tape end, and defect detection.	Parallel data
13	D1	Data	Output		
14	D2	Data	Output		
15	D3	Data	Output		
16	D4	Data	Output		
17	RESET	Reset	Output	A reset pulse is output to reset the servo IC (IC1) every time the power switch is turned ON.	⊓
18	$\overline{\text{INT}}$	Interrupt request	Output	The moment the data is output to CPU-2, an interrupt request pulse is output to store the data into CPU-2.	⊔
19	————	————	——	Not used.	
20	TEST			Connected to B + 12V.	
21	Vss	Power terminal		B + 12V	
22	KEY SENSE			Not used.	
23	CI-OUT	Cassette IN display	Output	Output to display the cassette mark during cassette loading.	H: during cassette loading
24	————	————	——	Not used.	

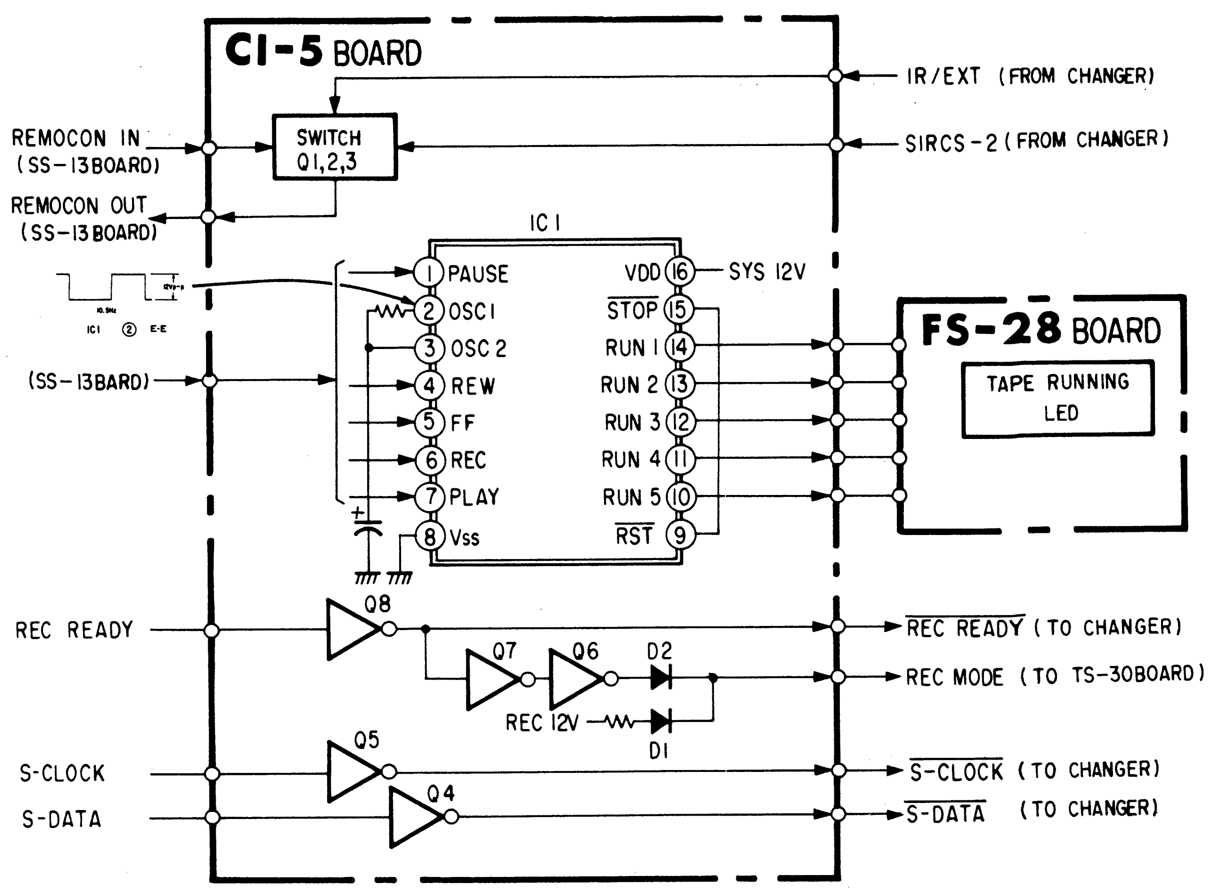
25	VTR SEL OUT	TV/videoselecting	Output	Output to change-over the antenna of an RF modulator to TV side or video side. "H" is automatically output in the PB mode. Output is inverted every time a TV/VTR switch or commander switch is pressed.	H: VTR side L: TV side
26	S • C • IN	Output for Cassette IN reading	Output	Output to inform CPU-1 that loading is completed. When loading is completed, a cassette IN switch (S991) is pressed by the cassette to store into a 5-pin terminal.	
27	S • C • OFF	Output for Cassette OFF reading	Output	Output to inform CPU-1 that unloading is completed and the cassette is unthreaded. During unthreading, a cassette OFF switch (S301) is turned ON by the cam to store into a 5-pin terminal.	
28	S • L • END	Output for threading end reading	Output	Output to inform CPU-1 that threading is completed. During end of threading, a threading end switch (S993) is turned ON to store into a 5-pin terminal.	
29	S • UN • L • END	Output for unthreading end reading	Output	Output to inform CPU-1 that unthreading is completed. During end of unthreading, an unthreading end switch (S994) is turned ON to store into a 5-pin terminal.	
30	———	———	——	Not used.	
31	———	———	——	Not used.	
32	———	———	——	Not used.	
33	TMR • SW	TIMER REC mode	Input	Goes "H" when a TIMER REC switch is turned ON. Input to inform CPU-1 that the unit is in the TIMER REC mode.	L: when not in the TIMER REC mode H: when in the TIMER REC mode
34	$\overline{\text{REC}}$	REC mode	Input	Input when pressing a REC switch and sensing the REC signal from a remote controller.	
35	$\overline{\text{FF/CUE}}$	FF/BETASCAN mode	Input	Input when pressing a FF/BETASCAN switch and sensing the FF/BETASCAN signal from a remote controller.	
36	$\overline{\text{STOP}}$	STOP mode	Input	Input when pressing a stop switch and sensing the stop signal from a remote controller.	
37	$\overline{\text{PAUSE}}$	PAUSE mode	Input	Input when pressing a pause switch and sensing the pause signal from a remote controller.	
38	$\overline{\text{PLAY}}$	PB mode	Input	Input when pressing a PB switch and sensing the PB signal from a remote controller.	
39	$\overline{\text{REW/REV}}$	REW/BETASCAN mode	Input	Input when pressing REW/BETASCAN switch and sensing the REW/BETASCAN signal from a remote controller.	
40	$\overline{\text{VTR SEL}}$	VTR/TV antenna selecting	Input	Input when pressing a VTR/TV switch and sensing the VTR/TV signal from a remote controller.	
41	Vcc	Power terminal		Grounding side	
42	CLK	Clock	Input	External clock signal input	 400kHz

- **Input/output terminal of system control IC (IC402)**

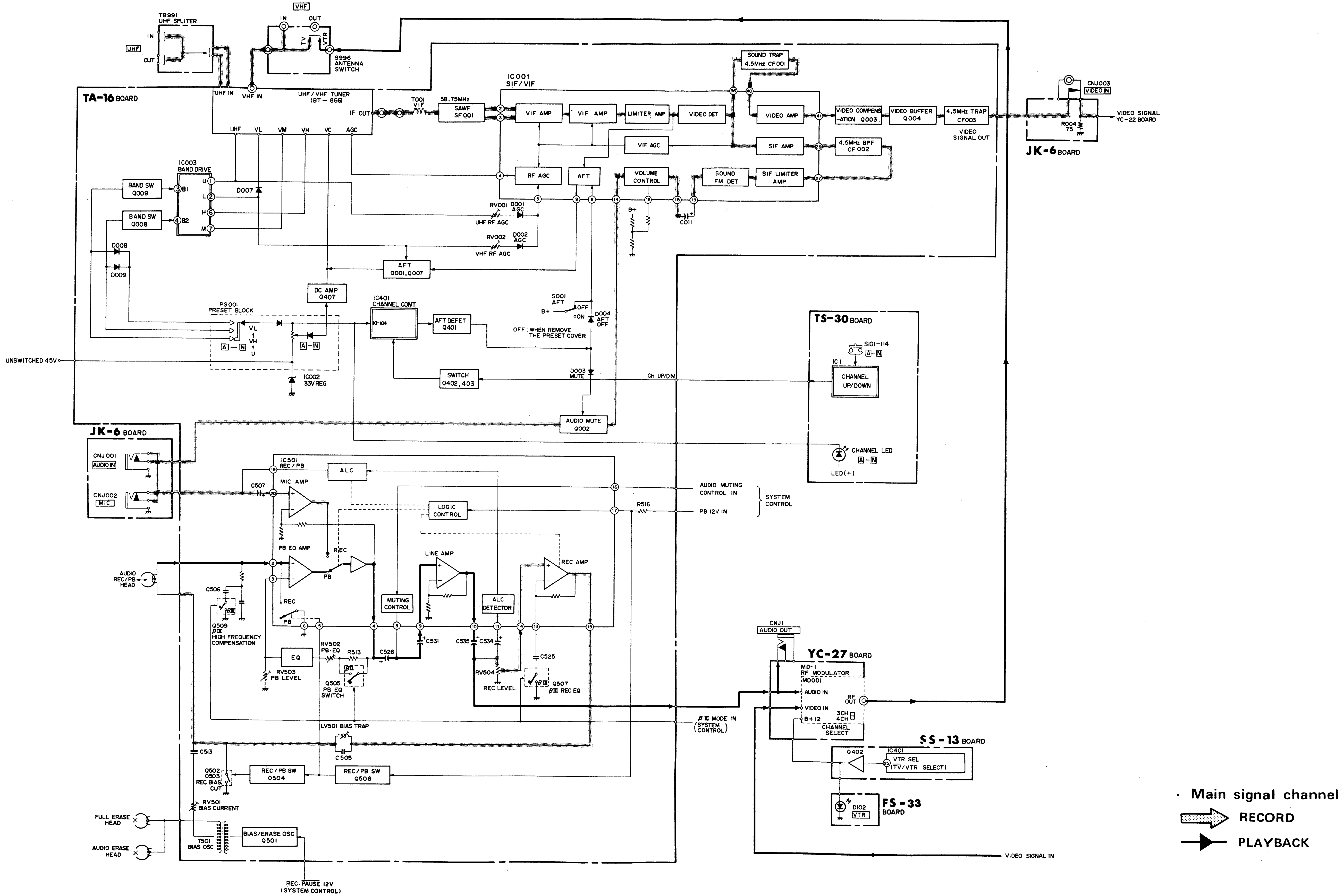
Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	————	————	——	Not used.	
2	LOAD	Loading	Output	Output to perform loading and threading.	_┌→
3	UN LOAD	Unloading	Output	Output to perform unloading and unthreading.	_┌→
4	CAP STOP	Capstan motor stop	Output	Output to stop the capstan motor.	_┌→
5	DRUM STOP	Drum motor stop	Output	Output to stop the drum motor.	_┌→
6	$\overline{\text{INT}}$	Interrupt request	Input	An interrupt request pulse is input the moment the data is fed from CPU-1. The data from CPU-1 is stored into CPU-2.	‾⊔‾
7	RESET	Reset	Input	Input to initialize CPU-2. A pulse is input every time the power switch is turned ON/OFF.	_⊓_
8	REEL STOP	Reel motor stop	Output	Output to stop the reel motor.	_┌→
9	REEL LOW	Reel Low	Output	Output to speed down the reel motor.	_┌→
10	REEL FWD	Reel rotation in the FWD direction	Output	Output to change over the rotational direction of a reel.	H: FWD direction L: Reverse direction
11	————	————	——	Not used.	
12	UN BRK S	Brake canceling and plunger starting	Output	Output to start the plunger to release the brake of a take-up reel.	_⊓_
13	UN BRK H	Brake canceling and plunger holding	Output	Output to hold the brake plunger.	_┌→
14	PINCH S	Pinch roller plunger starting	Output	During loading (unloading) and threading (unthreading), changes over the drive of a loading motor. Output to start the plunger to pressure-contact a pinch roller.	_⊓_
15	PINCH H	Pinch roller plunger	Output	Output to hold the pinch roller plunger.	_┌→
16	FF/REW OUT	FF/REW mode	Output	Output when entering the FF, REW, BETASCAN, and BETA SKIPSCAN modes.	_┌→
17	REW OUT	REW mode	Output	Output when entering the REW and BETASCAN (REW) modes.	_┌→
18	PLAY OUT	PB mode	Output	Output when entering the PB, BETASCAN, BETA SKIPSCAN and PB PAUSE modes.	_┌→
19	REC OUT	REC mode	Output	Output when entering the REC and REC PAUSE modes.	_┌→
20	TEST			Connected to B + 12V.	
21	Vss	Power terminal		B + 12V	
22	———— REC • $\overline{\text{P}}$ 2	———— REC • PAUSE 2	—— Output	Not used..... FORMER Output when entering the REC • PAUSE mode.... NEW	———— H: REC mode L: REC • PAUSE mode

23	REC · $\overline{P}$	REC · PAUSE	Output	Output when entering the REC · PAUSE mode.	H: REC mode L: REC · PAUSE mode
24	V MUTE	Video muting	Output	Video signal muting output	_|‾→
25	MC	Mode control	Output	Output when entering the BETASCAN, PB · PAUSE and BETA SKIPSCAN modes.	_|‾→
26	A MUTE	Audio muting	Output	Audio signal muting output	_|‾→
27	PAUSE OUT	PAUSE	Output	Output when entering the PUASE mode.	_|‾→
28	N.C				
29	PAUSE LMP	PAUSE display	Output	Display-output when entering the PAUSE mode.	_|‾→: PB · PAUSE ⎍⎍⎍ : REC · PAUSE
30	βI	βI PB mode	Output	Output when playing back the βI tape.	_|‾→
31	βIII	βIII mode	Output	βIII/βII mode selecting output	H: βIII mode L: βII mode
32	INHIBIT	Data transfer inhibiting	Output	Output to inhibit the data transfer by informing CPU-1 that CPU-2 is in data processing.	_|‾|_
33	βIII/$\overline{\beta II}$	REC time changing-over	Input	Input to change over the REC time	H: REC in the βIII mode L. REC in the βII mode
34	βI CANCEL	βI PB inhibiting	Input	Input to inhibit PB in the βI mode.	H: βI PB inhibiting L: Inhibit canceling
35	CTL IN	CTL signal	Input	A CTL signal is input in the PB mode. The video muting (V MUTE) output goes "H" when no CTL signal is input. PB mode discrimination.	_|‾|_|‾|
36	D4	Data	Input	Data input from CPU-1	Parallel data
37	D3	Data	Input		
38	D2	Data	Input		
39	D1	Data	Input		
40	D0	Data	Input		
41	Vcc	Power terminal		Grounding side	
42	CLK	Clock	Input	External clock signal input	⎍⎍⎍ *400kHz*

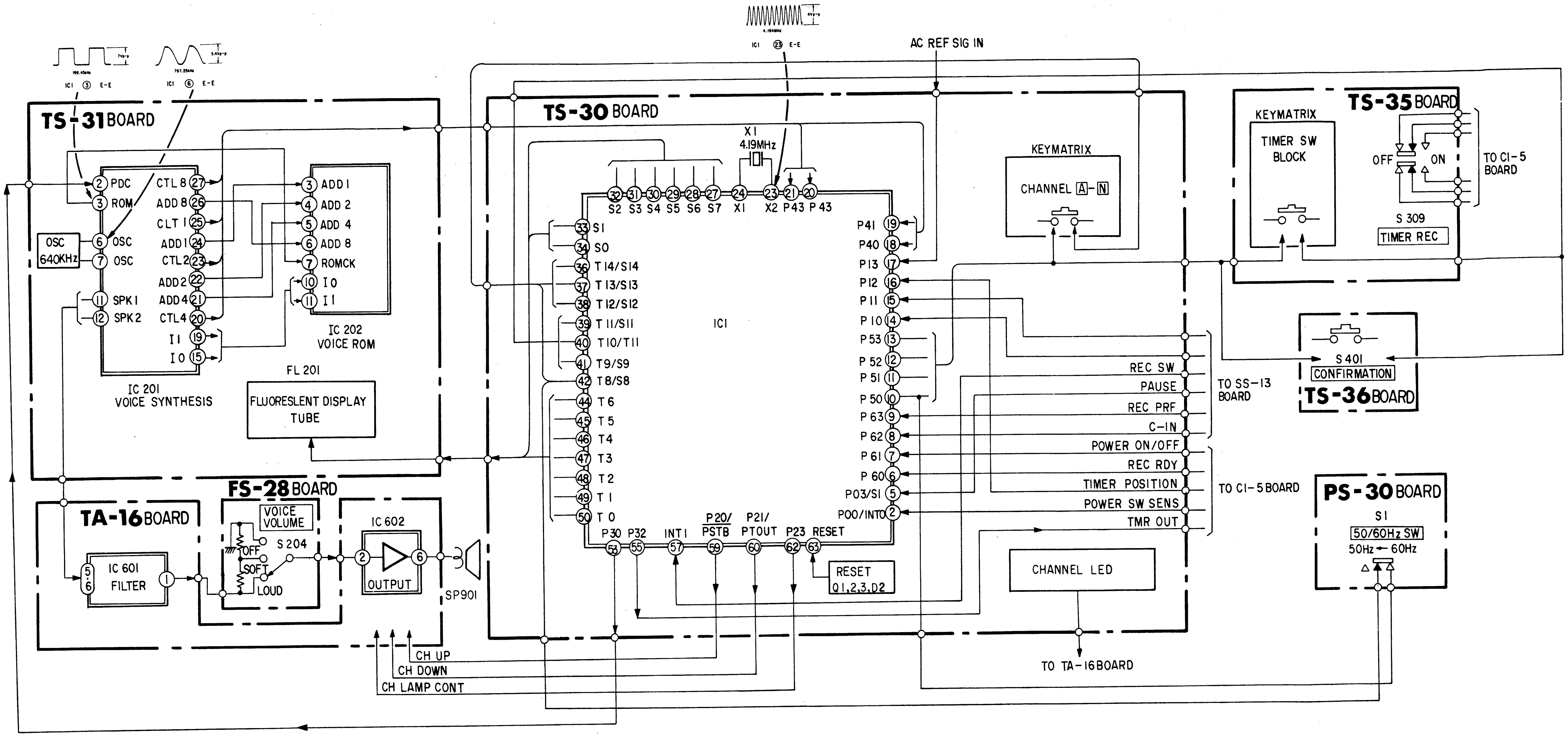
3-9. CHANGER CIRCUIT INTERFACE & TAPE RUNNING LED


CI-5 BOARD
IR/EXT (FROM CHANGER)
REMOCON IN (SS-13BOARD)
SWITCH Q1,2,3
SIRCS-2 (FROM CHANGER)
REMOCON OUT (SS-13BOARD)
IC1
① PAUSE
② OSC1
③ OSC2
④ REW
⑤ FF
⑥ REC
⑦ PLAY
⑧ Vss
VDD ⑯
STOP ⑮
RUN 1 ⑭
RUN 2 ⑬
RUN 3 ⑫
RUN 4 ⑪
RUN 5 ⑩
RST ⑨
SYS 12V
(SS-13BARD)
FS-28 BOARD
TAPE RUNNING LED
REC READY
Q8
Q7
Q6
D2
REC 12V
D1
Q5
Q4
S-CLOCK
S-DATA
REC READY (TO CHANGER)
REC MODE (TO TS-30BOARD)
S-CLOCK (TO CHANGER)
S-DATA (TO CHANGER)

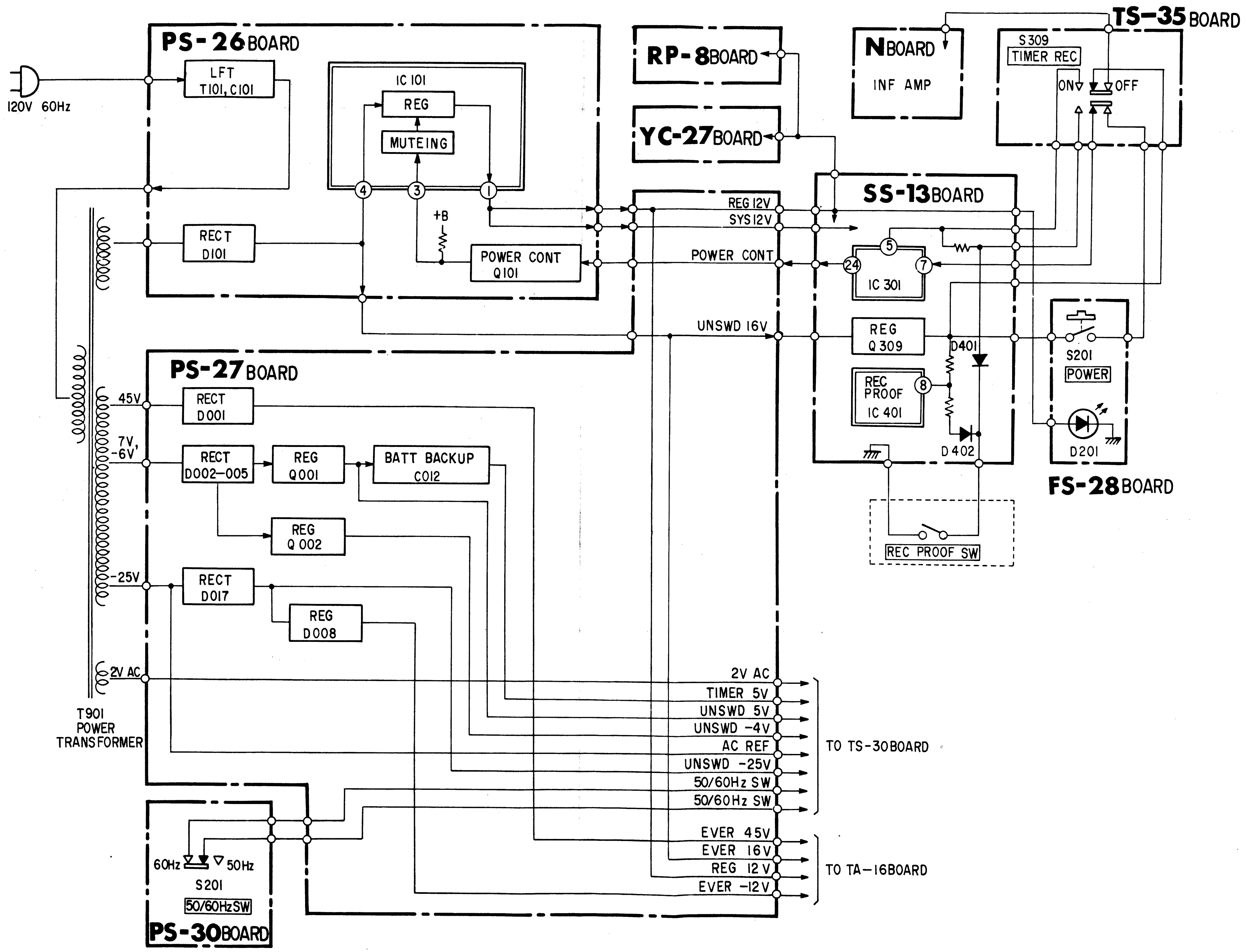
3-10. TUNER/AUDIO BLOCK DIAGRAM


TB991 UHF SPLITER
UHF
IN
OUT
VHF
IN
OUT
TV
VTR
S996 ANTENNA SWITCH
TA-16 BOARD
UHF IN
VHF IN
UHF / VHF TUNER (BT – 866)
IF OUT
UHF
VL
VM
VH
VC
AGC
T001 VIF
58.75MHz SAWF SF001
IC001 SIF/VIF
VIF AMP
VIF AMP
LIMITER AMP
VIDEO DET
SOUND TRAP 4.5MHz CF001
VIDEO AMP
VIDEO COMPENSATION Q003
VIDEO BUFFER Q004
4.5MHz TRAP CF003
VIDEO SIGNAL OUT
VIF AGC
SIF AMP
4.5MHz BPF CF 002
RF AGC
AFT
VOLUME CONTROL
SOUND FM DET
SIF LIMITER AMP
C011
B+
CNJ003 VIDEO IN
R004 75
VIDEO SIGNAL YC-22 BOARD
JK-6 BOARD
IC003 BAND DRIVE
BAND SW Q009
BAND SW Q008
B1
B2
U
L
H
M
D007
RV001 D001 AGC
UHF RF AGC
RV002 D002 AGC
VHF RF AGC
D008
D009
AFT Q001, Q007
DC AMP Q407
PS001 PRESET BLOCK
VL
VH
U
A – N
IC002 33V REG
UNSWITCHED 45V
IC401 CHANNEL CONT
AFT DEFEAT Q401
S001 AFT
B+
OFF
ON
D004 AFT OFF
OFF : WHEN REMOVE THE PRESET COVER
SWITCH Q402, 403
D003 MUTE
CH UP/DN
AUDIO MUTE Q002
TS-30 BOARD
S101–114
A – N
IC1
CHANNEL UP/DOWN
CHANNEL LED A – N
LED(+)
JK-6 BOARD
CNJ001 AUDIO IN
CNJ002 MIC
IC501 REC / PB
C507
MIC AMP
ALC
LOGIC CONTROL
AUDIO MUTING CONTROL IN
R516
PB 12V IN
SYSTEM CONTROL
PB EQ AMP
REC
PB
LINE AMP
REC AMP
AUDIO REC/PB HEAD
C506
REC
PB
Q509 βIII HIGH FREQUENCY COMPENSATION
MUTING CONTROL
ALC DETECTOR
C531
C535
C534
C525
EQ
RV502 PB-EQ
R513
C526
RV503 PB LEVEL
Q505 PB EQ SWITCH
RV504
REC LEVEL
Q507 βIII REC EQ
βIII MODE IN (SYSTEM CONTROL)
LV501 BIAS TRAP
C505
C513
Q502 Q503 REC BIAS CUT
REC/PB SW Q504
REC/PB SW Q506
RV501 BIAS CURRENT
FULL ERASE HEAD
AUDIO ERASE HEAD
T501 BIAS OSC
BIAS/ERASE OSC Q501
REC-PAUSE 12V (SYSTEM CONTROL)
CNJ1 AUDIO OUT
YC-27 BOARD
MD-1 RF MODULATOR MD001
AUDIO IN
VIDEO IN
B+12
RF OUT
3CH
4CH
CHANNEL SELECT
SS-13 BOARD
Q402
IC401
VTR SEL (TV/VTR SELECT)
FS-33 BOARD
D102 VTR
VIDEO SIGNAL IN
· Main signal channel
RECORD
PLAYBACK

3-11. TIMER, VOICE SYNTHESIS BLOCK DIAGRAM

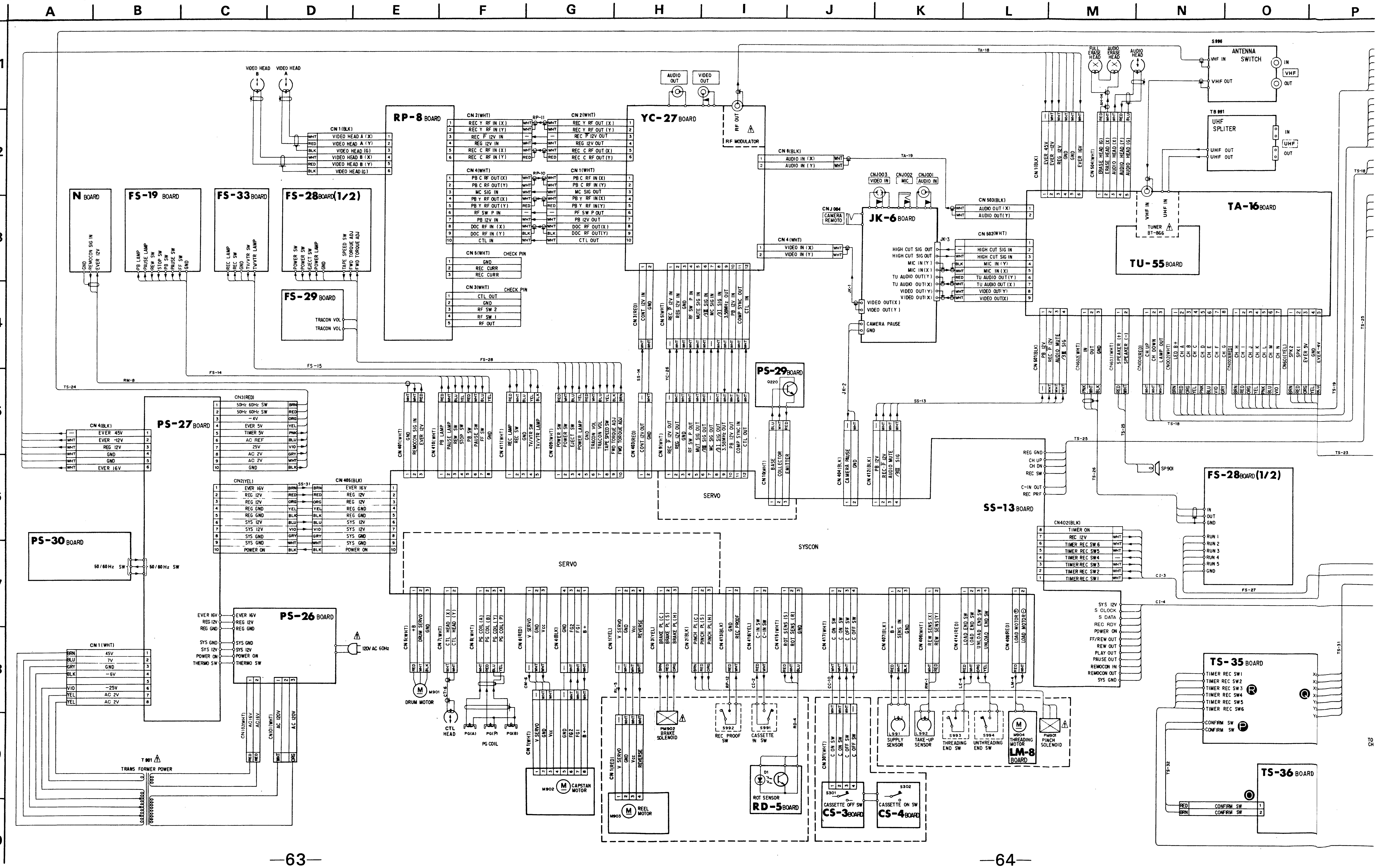

IC1 ③ E-E
IC1 ⑥ E-E
IC1 ㉓ E-E
AC REF SIG IN
TS-31 BOARD
②PDC
③ROM
⑥OSC
⑦OSC
OSC 640KHz
⑪SPK1
⑫SPK2
CTL8 ㉗
ADD8 ㉖
CLT1 ㉕
ADD1 ㉔
CTL2 ㉓
ADD2 ㉒
ADD4 ㉑
CTL4 ⑳
I1 ⑲
I0 ⑮
IC 201
VOICE SYNTHESIS
③ADD1
④ADD2
⑤ADD4
⑥ADD8
⑦ROMCK
⑩I0
⑪I1
IC 202
VOICE ROM
FL 201
FLUORESLENT DISPLAY TUBE
TS-30 BOARD
X1
4.19MHz
S2 S3 S4 S5 S6 S7 X1 X2 P43 P43
S1
S0
T14/S14
T13/S13
T12/S12
T11/S11
T10/T11
T9/S9
T8/S8
T6
T5
T4
T3
T2
T1
T0
IC1
P41
P40
P13
P12
P11
P10
P53
P52
P51
P50
P63
P62
P61
P60
P03/SI
P00/INT0
P30
P32
INT1
P20/PSTB
P21/PTOUT
P23
RESET
RESET
Q1,2,3,D2
KEYMATRIX
CHANNEL Ⓐ-Ⓝ
REC SW
PAUSE
REC PRF
C-IN
POWER ON/OFF
REC RDY
TIMER POSITION
POWER SW SENS
TMR OUT
TO SS-13 BOARD
TO CI-5 BOARD
CHANNEL LED
TO TA-16 BOARD
TS-35 BOARD
KEYMATRIX
TIMER SW BLOCK
OFF
ON
TO CI-5 BOARD
S 309
TIMER REC
S 401
CONFIRMATION
TS-36 BOARD
PS-30 BOARD
S1
50/60Hz SW
50Hz ← 60Hz
TA-16 BOARD
IC 601
FILTER
FS-28 BOARD
VOICE VOLUME
S 204
OFF
SOFT
LOUD
IC 602
OUTPUT
SP901
CH UP
CH DOWN
CH LAMP CONT

3-12. POWER SUPPLY BLOCK DIAGRAM


120V 60Hz
PS-26 BOARD
LFT
T101, C101
IC 101
REG
MUTEING
④ ③ ①
+B
RECT
D101
POWER CONT
Q101
RP-8 BOARD
YC-27 BOARD
N BOARD
INF AMP
TS-35 BOARD
S309
TIMER REC
ON
OFF
SS-13 BOARD
REG 12V
SYS 12V
POWER CONT
UNSWD 16V
⑤
㉔
⑦
IC 301
REG
Q309
D401
REC PROOF
IC 401
⑧
D402
REC PROOF SW
S201
POWER
D201
FS-28 BOARD
PS-27 BOARD
45V
RECT
D001
7V,
-6V
RECT
D002–005
REG
Q001
BATT BACKUP
C012
REG
Q002
-25V
RECT
D017
REG
D008
2V AC
T901
POWER
TRANSFORMER
2V AC
TIMER 5V
UNSWD 5V
UNSWD -4V
AC REF
UNSWD -25V
50/60Hz SW
50/60Hz SW
TO TS-30 BOARD
EVER 45V
EVER 16V
REG 12V
EVER -12V
TO TA-16 BOARD
60Hz
50Hz
S201
50/60Hz SW
PS-30 BOARD

SECTION 4
SCHEMATIC DIAGRAM and PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM


A
B
C
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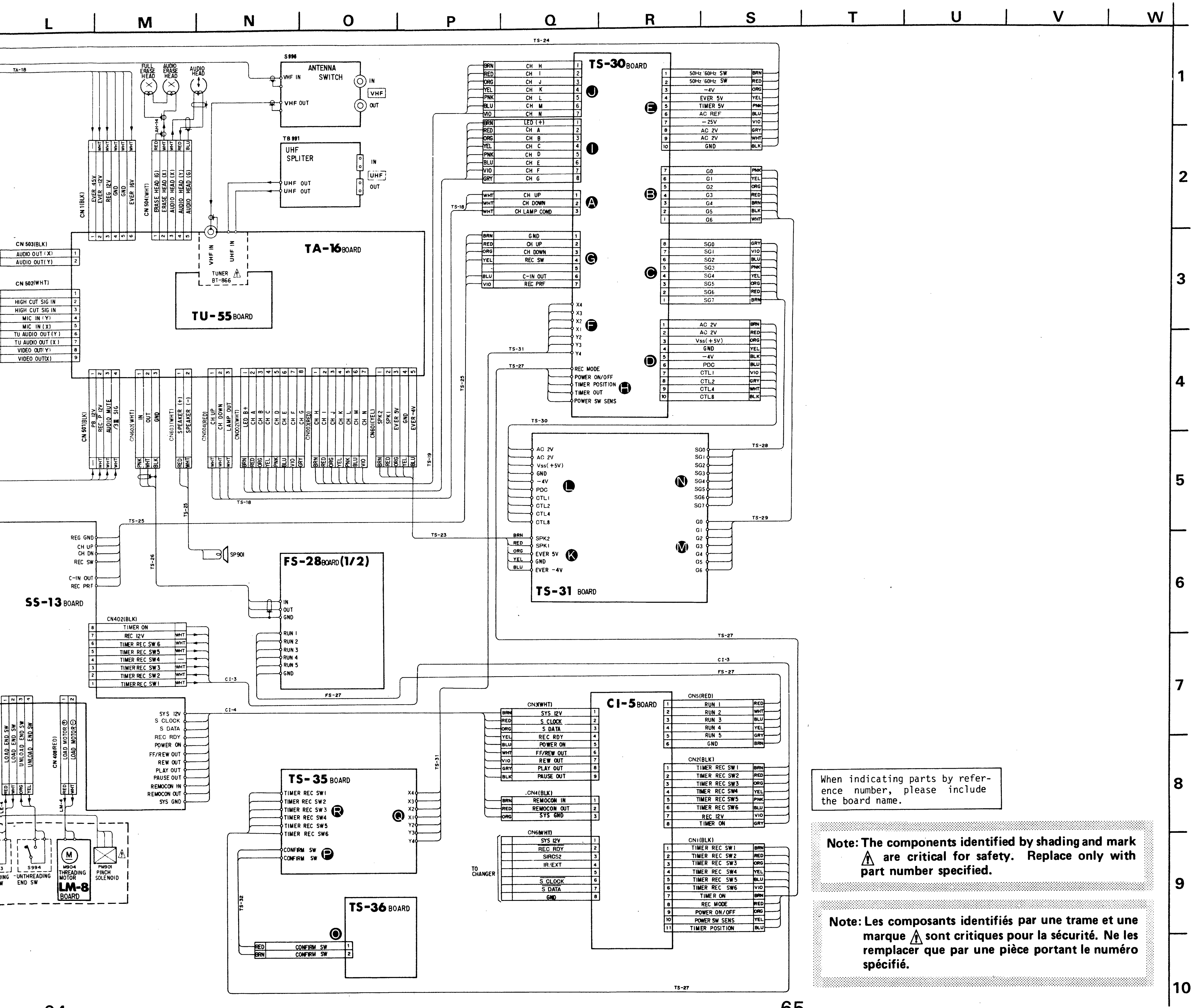
G
H
I
J
K
L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
VIDEO HEAD B
VIDEO HEAD A
RP-8 BOARD
YC-27 BOARD
AUDIO OUT
VIDEO OUT
RF MODULATOR
N BOARD
FS-19 BOARD
FS-33 BOARD
FS-28 BOARD (1/2)
FS-29 BOARD
JK-6 BOARD
TA-16 BOARD
TU-55 BOARD
ANTENNA SWITCH
UHF SPLITER
FULL ERASE HEAD
AUDIO ERASE HEAD
AUDIO HEAD
PS-27 BOARD
PS-29 BOARD
PS-30 BOARD
PS-26 BOARD
120V AC 60Hz
SERVO
SYSCON
SS-13 BOARD
FS-28 BOARD (1/2)
TS-35 BOARD
TS-36 BOARD
TRANS FORMER POWER
DRUM MOTOR
CTL HEAD
PG COIL
CAPSTAN MOTOR
REEL MOTOR
BRAKE SOLENOID
REC PROOF SW
CASSETTE IN SW
ROT SENSOR
RD-5 BOARD
CS-3 BOARD
CS-4 BOARD
SUPPLY SENSOR
TAKE-UP SENSOR
THREADING END SW
UNTHREADING END SW
THREADING MOTOR
LM-8 BOARD
PINCH SOLENOID
SP901


L
M
N
O
P
Q
R
S
T
U
V
W
1
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3
4
5
6
7
8
9
10
TS-30 BOARD
TA-16 BOARD
TU-55 BOARD
ANTENNA SWITCH
UHF SPLITER
TUNER BT-866
FS-28 BOARD (1/2)
TS-31 BOARD
SS-13 BOARD
CI-5 BOARD
TS-35 BOARD
TS-36 BOARD
LM-8 BOARD
SP901
TO CHANGER

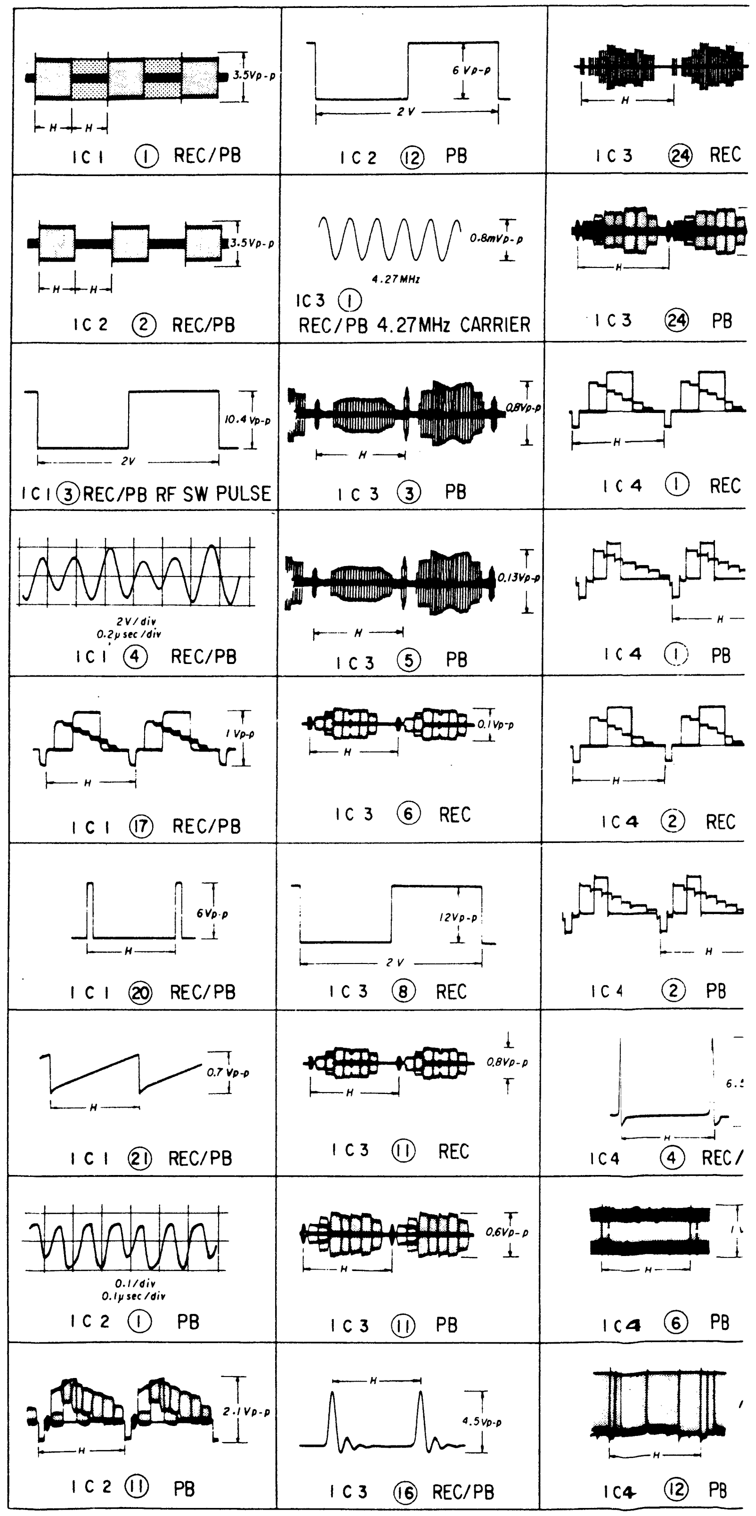
When indicating parts by reference number, please include the board name.

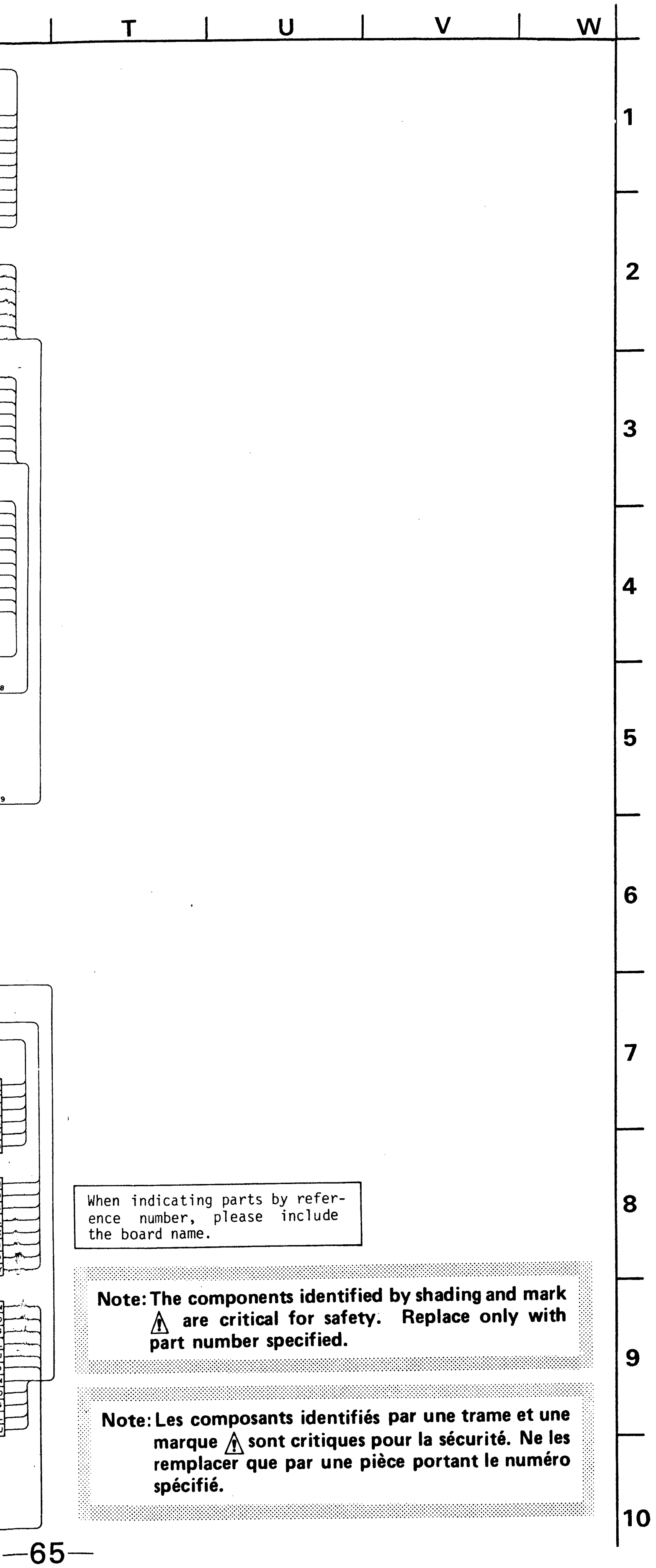
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

WAVEFORM

YC-27 BOARD





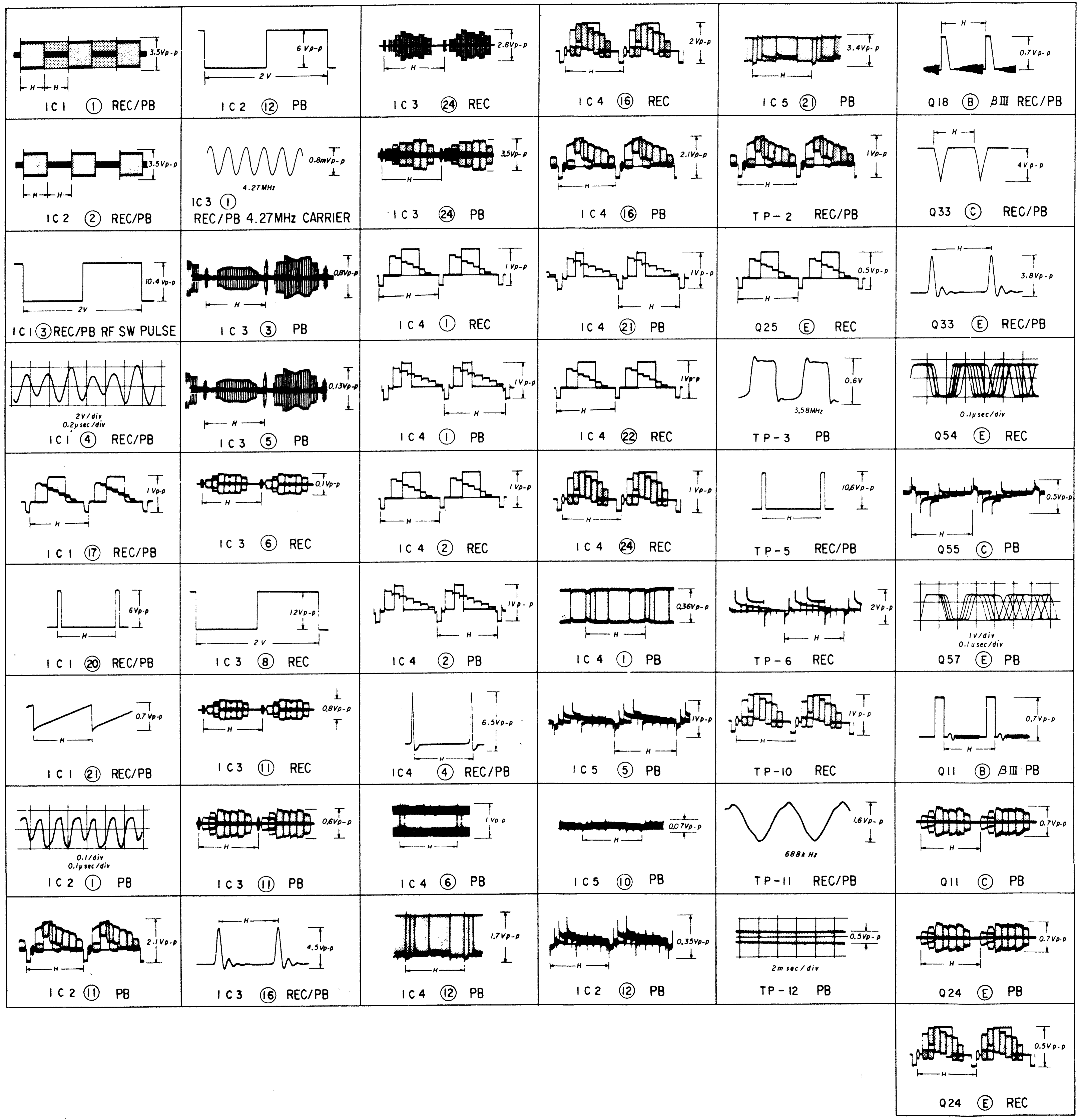
When indicating parts by reference number, please include the board name.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

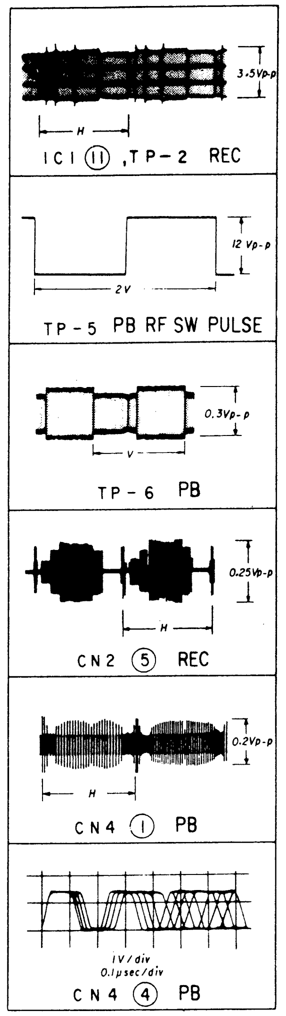
Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

WAVEFORM

YC-27 BOARD



RP-8 BOARD

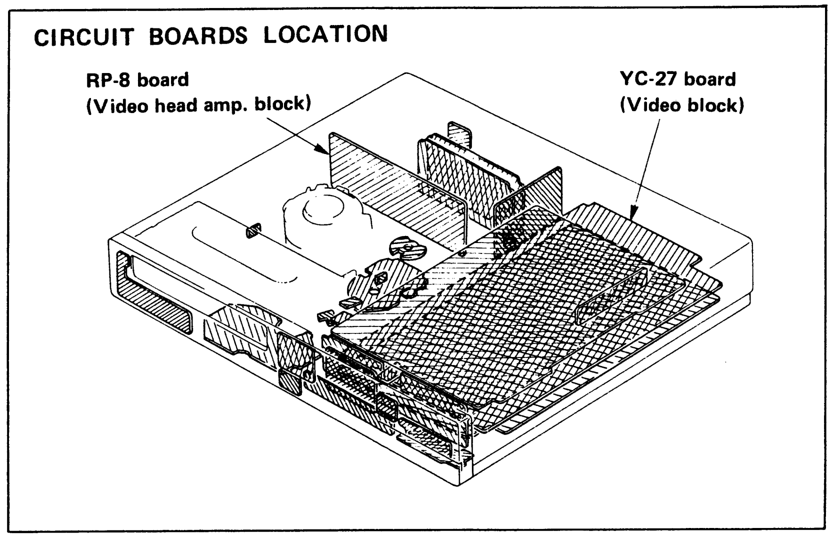


4-2. SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

YC-27 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS), RP-8 (PB DOWN-CONVERTED CHROMA, Y-FM SIGNAL, RECORD/PLAYBACK) SCHEMATIC DIAGRAM

– Ref. No. YC-27 BOARD : 1,000 series, RP-8 BOARD : 2,000 series –

CIRCUIT BOARDS LOCATION

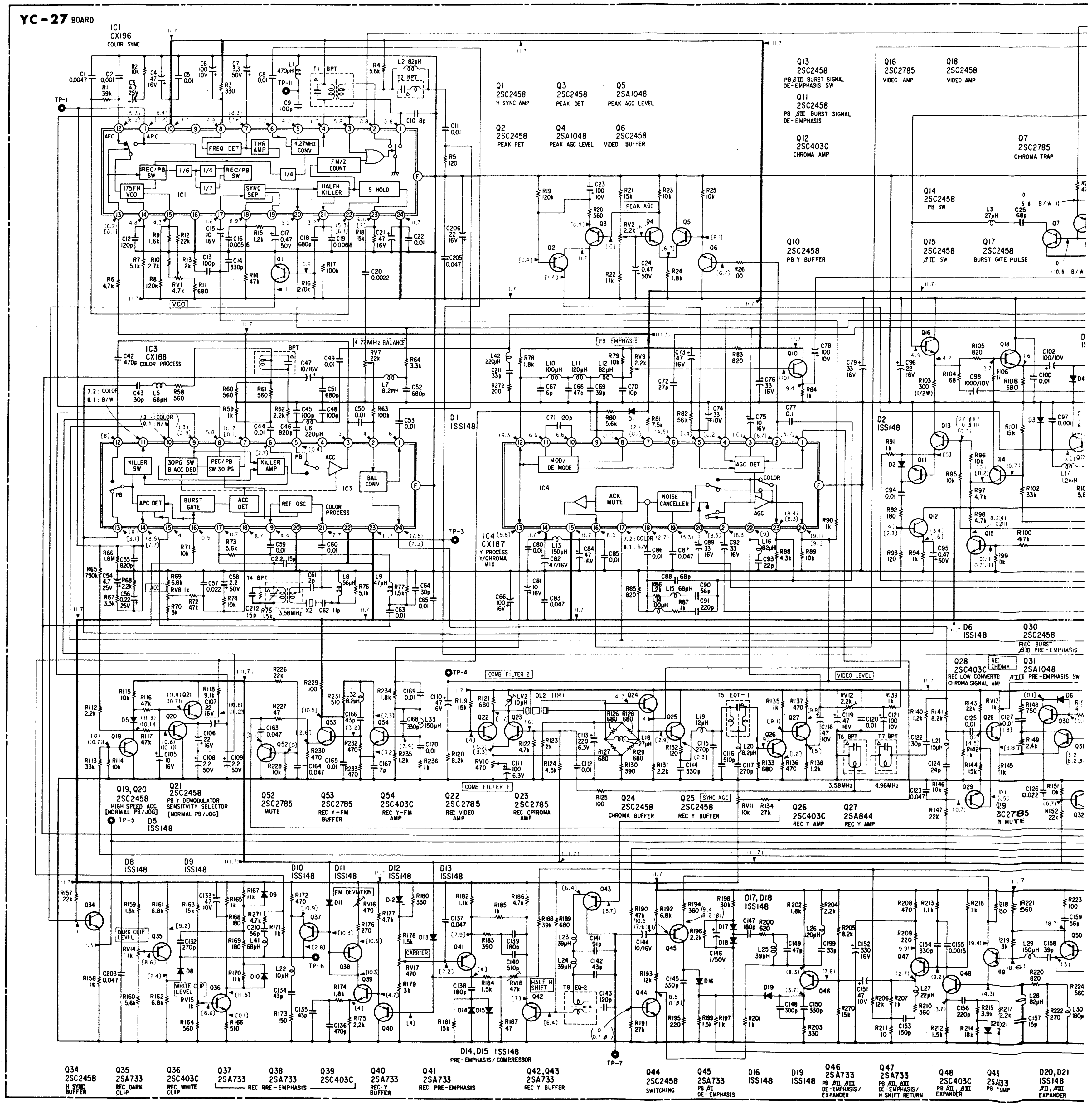

RP-8 board
(Video head amp. block)
YC-27 board
(Video block)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- : Nonflammable resistor
- : Fusible resistor
- ▭ : adjustment for repair.
- ——— : B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- **All voltages are dc measured with a VOM (10 MΩ).**

When indicating parts by reference number, please include the board name.


A
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P
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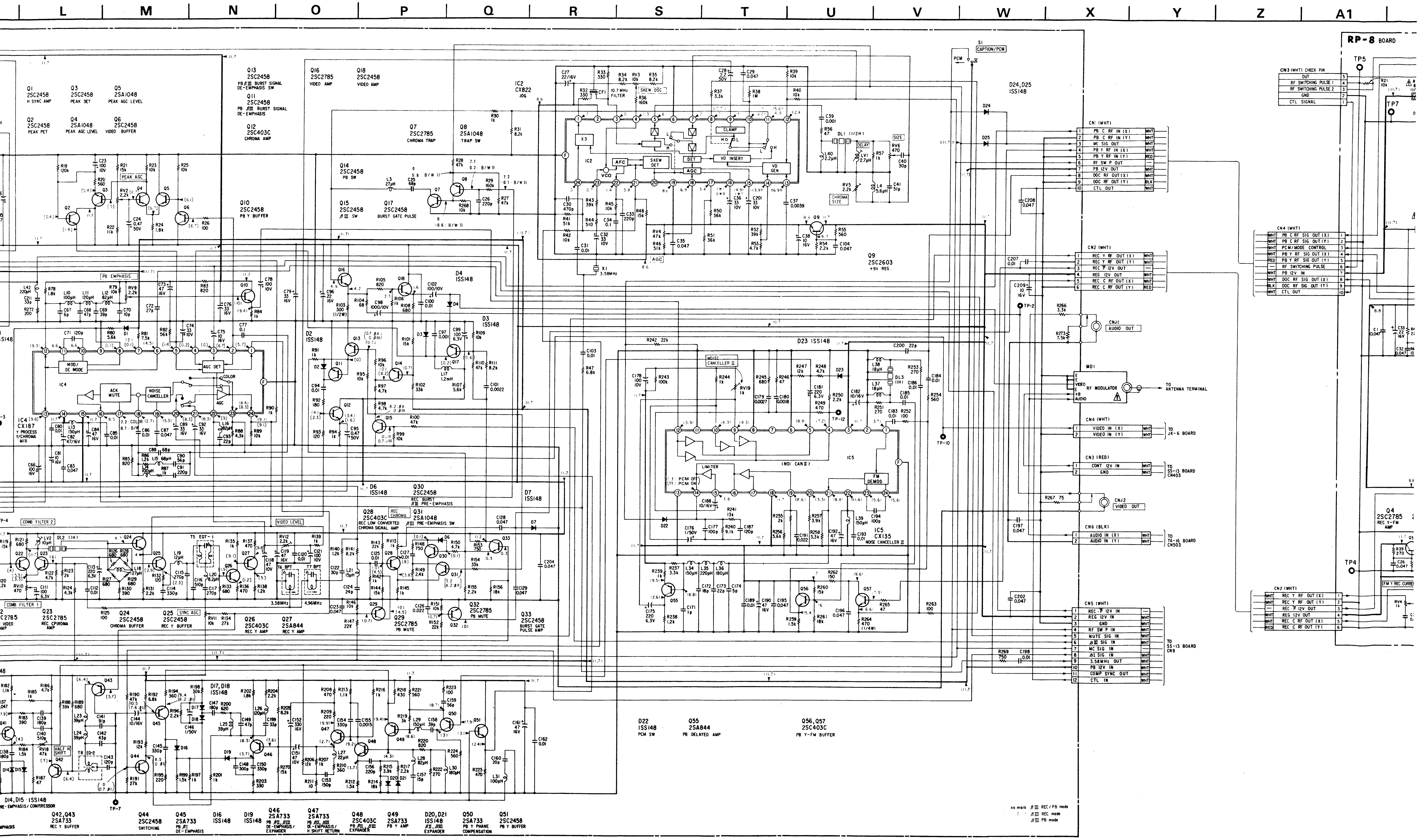
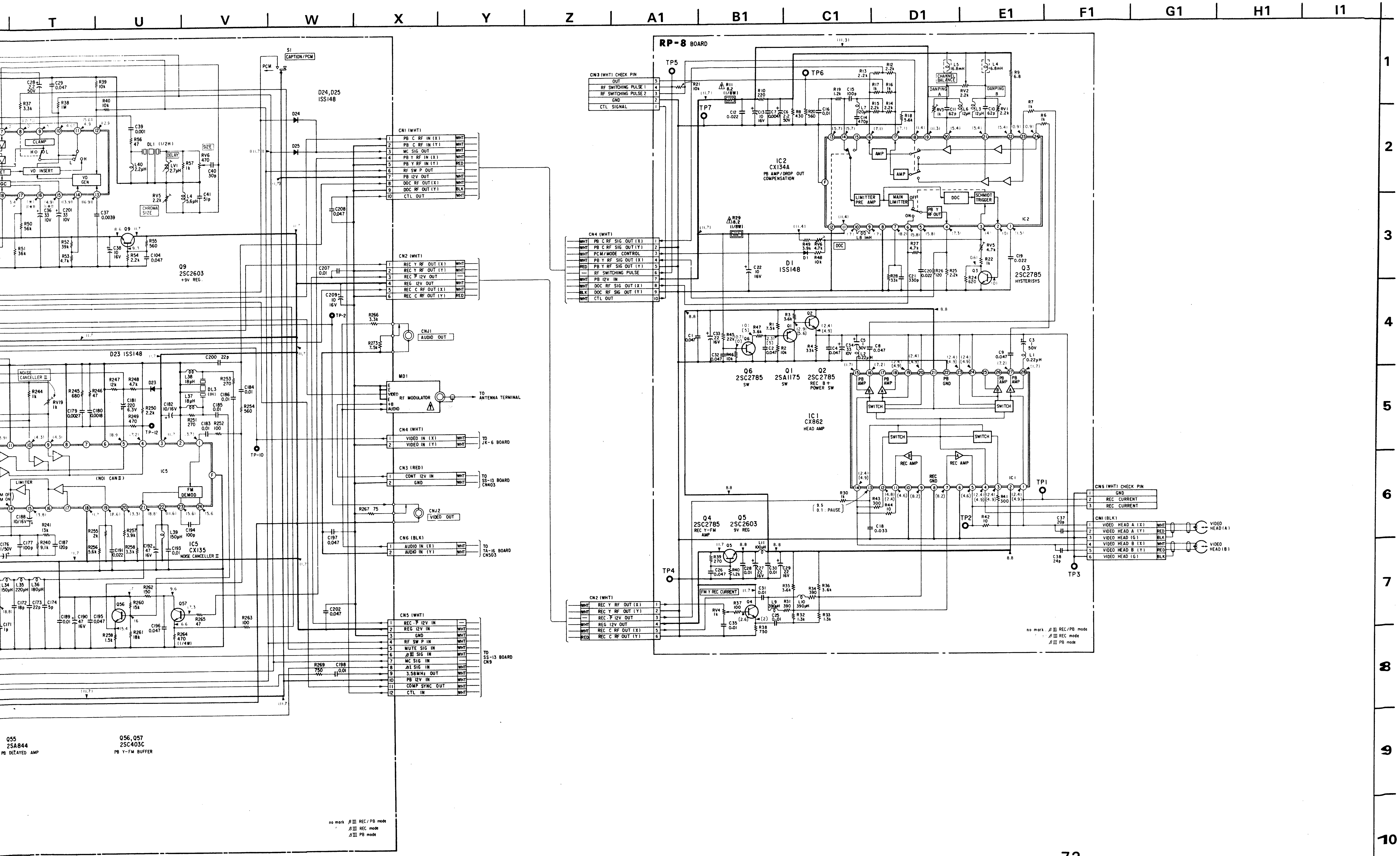
4
5
6
7
8
9
10
YC-27 BOARD
IC1 CX196 COLOR SYNC
IC3 CX188 COLOR PROCESS
IC4 CX187 Y PROCESS Y/CHROMA MIX
Q1 2SC2458 H SYNC AMP
Q2 2SC2458 PEAK DET
Q3 2SC2458 PEAK DET
Q4 2SA1048 PEAK AGC LEVEL
Q5 2SA1048 PEAK AGC LEVEL
Q6 2SC2458 VIDEO BUFFER
Q7 2SC2785 CHROMA TRAP
Q10 2SC2458 PB Y BUFFER
Q11 2SC2458 PB βIII BURST SIGNAL DE-EMPHASIS
Q12 2SC403C CHROMA AMP
Q13 2SC2458 PB βIII BURST SIGNAL DE-EMPHASIS SW
Q14 2SC2458 PB SW
Q15 2SC2458 βIII SW
Q16 2SC2785 VIDEO AMP
Q17 2SC2458 BURST GATE PULSE
Q18 2SC2458 VIDEO AMP
Q19, Q20 2SC2458 HIGH SPEED ACC [NORMAL PB/JOG]
Q21 2SC2458 PB Y DEMODULATOR SENSITIVITY SELECTOR [NORMAL PB/JOG]
D5 1SS148
TP-5
Q22 2SC2785 REC VIDEO AMP
Q23 2SC2785 REC CHROMA AMP
Q24 2SC2458 CHROMA BUFFER
Q25 2SC2458 REC Y BUFFER
Q26 2SC403C REC Y AMP
Q27 2SA844 REC Y AMP
Q28 2SC403C REC LOW CONVERTED CHROMA SIGNAL AMP
Q29 2SC2785 MUTE
Q30 2SC2458 REC BURST βIII PRE-EMPHASIS
Q31 2SA1048 βIII PRE-EMPHASIS SW
Q52 2SC2785 MUTE
Q53 2SC2785 REC Y-FM BUFFER
Q54 2SC403C REC Y-FM AMP
Q34 2SC2458 H SYNC BUFFER
Q35 2SA733 REC DARK CLIP
Q36 2SC403C REC WHITE CLIP
Q37 2SA733
Q38 2SA733
Q39 2SC403C
REC PRE-EMPHASIS
Q40 2SA733 REC Y BUFFER
Q41 2SA733 REC PRE-EMPHASIS
Q42,Q43 2SA733 REC Y BUFFER
Q44 2SC2458 SWITCHING
Q45 2SA733 PB βI DE-EMPHASIS
D16 1SS148
D19 1SS148
Q46 2SA733 PB βII, βIII DE-EMPHASIS/ EXPANDER
Q47 2SA733 PB βII, βIII DE-EMPHASIS/ H SHIFT RETURN EXPANDER
Q48 2SC403C PB βII, βIII EXPANDER
D20, D21 1SS148 βII, βIII EXPANDER
D14, D15 1SS148 PRE-EMPHASIS/COMPRESSOR
TP-1
TP-3
TP-4
TP-6
TP-7
COMB FILTER 2
COMB FILTER 1
VIDEO LEVEL
PEAK AGC
PB EMPHASIS
4.27MHz BALANCE
VCO
FM DEVIATION
CARRIER
DARK CLIP LEVEL
WHITE CLIP LEVEL
HALF H SHIFT
SYNC AGC
3.58MHz
4.96MHz


L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
RP-8 BOARD
Q1 2SC2458 H SYNC AMP
Q2 2SC2458 PEAK PET
Q3 2SC2458 PEAK DET
Q4 2SA1048 PEAK AGC LEVEL
Q5 2SA1048 PEAK AGC LEVEL
Q6 2SC2458 VIDEO BUFFER
Q10 2SC2458 PB Y BUFFER
Q11 2SC2458 PB βIII BURST SIGNAL DE-EMPHASIS
Q12 2SC403C CHROMA AMP
Q13 2SC2458 PB βIII BURST SIGNAL DE-EMPHASIS SW
Q14 2SC2458 PB SW
Q15 2SC2458 βIII SW
Q16 2SC2785 VIDEO AMP
Q17 2SC2458 BURST GATE PULSE
Q18 2SC2458 VIDEO AMP
Q7 2SC2785 CHROMA TRAP
Q8 2SA1048 TRAP SW
IC2 CX822 JOG
D24,D25 1SS148
S1 CAPTION/PCM
PCM
Q9 2SC2603 +9V REG
X1 3.58MHz
IC4 CX187 Y PROCESS Y/CHROMA MIX
PB EMPHASIS
PEAK AGC
MOD/ DE MODE
ACK MUTE
NOISE CANCELLER
AGC DET
COLOR
AGC
SKEW OSC
SKEW DET
AFC
VCO
AGC
DET
VD INSERT
VD GEN
CLAMP
HD
DELAY
SIZE
CHROMA SIZE
10.7 MHz FILTER
D2 1SS148
D3 1SS148
D4 1SS148
D6 1SS148
D7 1SS148
D23 1SS148
NOISE CANCELLER II
LIMITER
FM DEMOD
(NOI CAN II)
IC5 CX135 NOISE CANCELLER II
(7 : PCM OFF) (11 : PCM ON)
TP-2
TP-10
TP-12
TP-4
TP-7
TP4
TP5
TP7
CN1 (WHT)
1 PB C RF IN (X)
2 PB C RF IN (Y)
3 MC SIG OUT
4 PB Y RF IN (X)
5 PB Y RF IN (Y)
6 RF SW P OUT
7 PB 12V OUT
8 DOC RF OUT (X)
9 DOC RF OUT (Y)
10 CTL OUT
CN2 (WHT)
1 REC Y RF OUT (X)
2 REC Y RF OUT (Y)
3 REC P 12V OUT
4 REC 12V OUT
5 REC C RF OUT (X)
6 REC C RF OUT (Y)
CNJ1 AUDIO OUT
MD1 RF MODULATOR
VIDEO
+B
AUDIO
TO ANTENNA TERMINAL
CN4 (WHT)
1 VIDEO IN (X)
2 VIDEO IN (Y)
TO JK-6 BOARD
CN3 (RED)
1 CONT 12V IN
2 GND
TO SS-13 BOARD CN403
CNJ2 VIDEO OUT
CN6 (BLK)
1 AUDIO IN (X)
2 AUDIO IN (Y)
TO TA-16 BOARD CN503
CN5 (WHT)
1 REC P 12V IN
2 REG 12V IN
3 GND
4 RF SW P IN
5 MUTE SIG IN
6 βIII SIG IN
7 MC SIG IN
8 βI SIG IN
9 3.58MHz OUT
10 PB 12V IN
11 COMP SYNC OUT
12 CTL IN
TO SS-13 BOARD CN9
CN3 (WHT) CHECK PIN
5 OUT
4 RF SWITCHING PULSE 1
3 RF SWITCHING PULSE 2
2 GND
1 CTL SIGNAL
CN4 (WHT)
1 PB C RF SIG OUT (X)
2 PB C RF SIG OUT (Y)
3 PCM/MODE CONTROL
4 PB Y RF SIG OUT (X)
5 PB Y RF SIG OUT (Y)
6 RF SWITCHING PULSE
7 PB 12V IN
8 DOC RF SIG OUT (X)
9 DOC RF SIG OUT (Y)
10 CTL OUT
CN2 (WHT)
1 REC Y RF OUT (X)
2 REC Y RF OUT (Y)
3 REC P 12V OUT
4 REG 12V OUT
5 REC C RF OUT (X)
6 REC C RF OUT (Y)
Q4 2SC2785 REC Y-FM AMP
FM Y REC CURRENT
COMB FILTER 2
COMB FILTER 1
T5 EQT-1
T6 BPT
T7 BPT
3.58MHz
4.96MHz
VIDEO LEVEL
REC CHROMA
SYNC AGC
HALF H SHIFT
Q23 2SC2785 REC CPIROMA AMP
Q24 2SC2458 CHROMA BUFFER
Q25 2SC2458 REC Y BUFFER
Q26 2SC403C REC Y AMP
Q27 2SA844 REC Y AMP
Q28 2SC403C REC LOW CONVERTED CHROMA SIGNAL AMP
Q29 2SC2785 PB MUTE
Q30 2SC2458 REC BURST βIII PRE-EMPHASIS
Q31 2SA1048 βIII PRE-EMPHASIS SW
Q32 2SC2785 PB MUTE
Q33 2SC2458 BURST GATE PULSE AMP
D22 1SS148 PCM SW
Q55 2SA844 PB DELAYED AMP
Q56,Q57 2SC403C PB Y-FM BUFFER
D14,D15 1SS148
PRE-EMPHASIS/COMPRESSOR
Q42,Q43 2SA733 REC Y BUFFER
Q44 2SC2458 SWITCHING
Q45 2SA733 PB βI DE-EMPHASIS
D16 1SS148
D17,D18 1SS148
D19 1SS148
Q46 2SA733 PB βI, βIII DE-EMPHASIS/ EXPANDER
Q47 2SA733 PB βI, βIII DE-EMPHASIS/ H SHIFT RETURN
Q48 2SC403C PB βI, βIII EXPANDER
Q49 2SA733 PB Y AMP
D20,D21 1SS148 EXPANDER
Q50 2SA733 PB Y PHANE COMPENSATION
Q51 2SC2458 PB Y BUFFER
no mark βIII REC/PB mode
( ) βIII REC mode
βIII PB mode


T
U
V
W
X
Y
Z
A1
B1
C1
D1
E1
F1
G1
H1
I1
1
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3
4
5
6
7
8
9
10
RP-8 BOARD
S1 CAPTION/PCM
PCM
D24,D25 1SS148
CN1 (WHT)
PB C RF IN (X)
PB C RF IN (Y)
MC SIG OUT
PB Y RF IN (X)
PB Y RF IN (Y)
RF SW P OUT
PB 12V OUT
DOC RF OUT (X)
DOC RF OUT (Y)
CTL OUT
CN2 (WHT)
REC Y RF OUT (X)
REC Y RF OUT (Y)
REC P 12V OUT
REG 12V OUT
REC C RF OUT (X)
REC C RF OUT (Y)
Q9 2SC2603 +9V REG.
TP-2
CNJ1 AUDIO OUT
MD1
RF MODULATOR
VIDEO
+B
AUDIO
TO ANTENNA TERMINAL
CN4 (WHT)
VIDEO IN (X)
VIDEO IN (Y)
TO JK-6 BOARD
CN3 (RED)
CONT 12V IN
GND
TO SS-13 BOARD CN403
CNJ2 VIDEO OUT
CN6 (BLK)
AUDIO IN (X)
AUDIO IN (Y)
TO TA-16 BOARD CN503
CN5 (WHT)
REC P 12V IN
REG 12V IN
GND
RF SW P IN
MUTE SIG IN
MC SIG IN
3.58MHz OUT
PB 12V IN
COMP SYNC OUT
CTL IN
TO SS-13 BOARD CN9
D23 1SS148
NOISE CANCELLER II
IC5 CX135 NOISE CANCELLER II
(NOI CAN II)
LIMITER
FM DEMOD
TP-12
TP-10
CLAMP
VD INSERT
VD GEN
CHROMA SIZE
DELAY
SIZE
Q55 2SA844 PB DELAYED AMP
Q56,Q57 2SC403C PB Y-FM BUFFER
no mark βIII REC/PB mode
βIII REC mode
βIII PB mode
CN3 (WHT) CHECK PIN
OUT
RF SWITCHING PULSE 1
RF SWITCHING PULSE 2
GND
CTL SIGNAL
TP5
TP6
TP7
CHANNEL BALANCE
DANPING A
DANPING B
IC2 CX134A PB AMP/DROP OUT COMPENSATION
AMP
LIMITTER PRE AMP
MAIN LIMITTER
DOC
SCHMIDT TRIGGER
PB Y RF OUT
CN4 (WHT)
PB C RF SIG OUT (X)
PB C RF SIG OUT (Y)
PCM/MODE CONTROL
PB Y RF SIG OUT (X)
PB Y RF SIG OUT (Y)
RF SWITCHING PULSE
PB 12V IN
DOC RF SIG OUT (X)
DOC RF SIG OUT (Y)
CTL OUT
D1 1SS148
Q3 2SC2785 HYSTERISYS
Q6 2SC2785 SW
Q1 2SA1175 SW
Q2 2SC2785 REC B+ POWER SW
IC1 CX862 HEAD AMP
PB AMP
SWITCH
REC AMP
PB GND
REC GND
TP1
TP2
TP3
TP4
(9.5 0 : PAUSE)
Q4 2SC2785 REC Y-FM AMP
Q5 2SC2603 9V REG
FM Y REC CURRENT
CN5 (WHT) CHECK PIN
GND
REC CURRENT
REC CURRENT
CN1 (BLK)
VIDEO HEAD A (X)
VIDEO HEAD A (Y)
VIDEO HEAD (G)
VIDEO HEAD B (X)
VIDEO HEAD B (Y)
VIDEO HEAD (G)
VIDEO HEAD (A)
VIDEO HEAD (B)
CN2 (WHT)
REC Y RF OUT (X)
REC Y RF OUT (Y)
REC P 12V OUT
REG 12V OUT
REC C RF OUT (X)
REC C RF OUT (Y)
no mark βIII REC/PB mode
βIII REC mode
βIII PB mode

YC-27 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS), RP-8 (DOWN-CONVERTED CHROMA, Y-FM SIGNAL, RECORD/PLAYBACK) PRINTED WIRING BOARDS

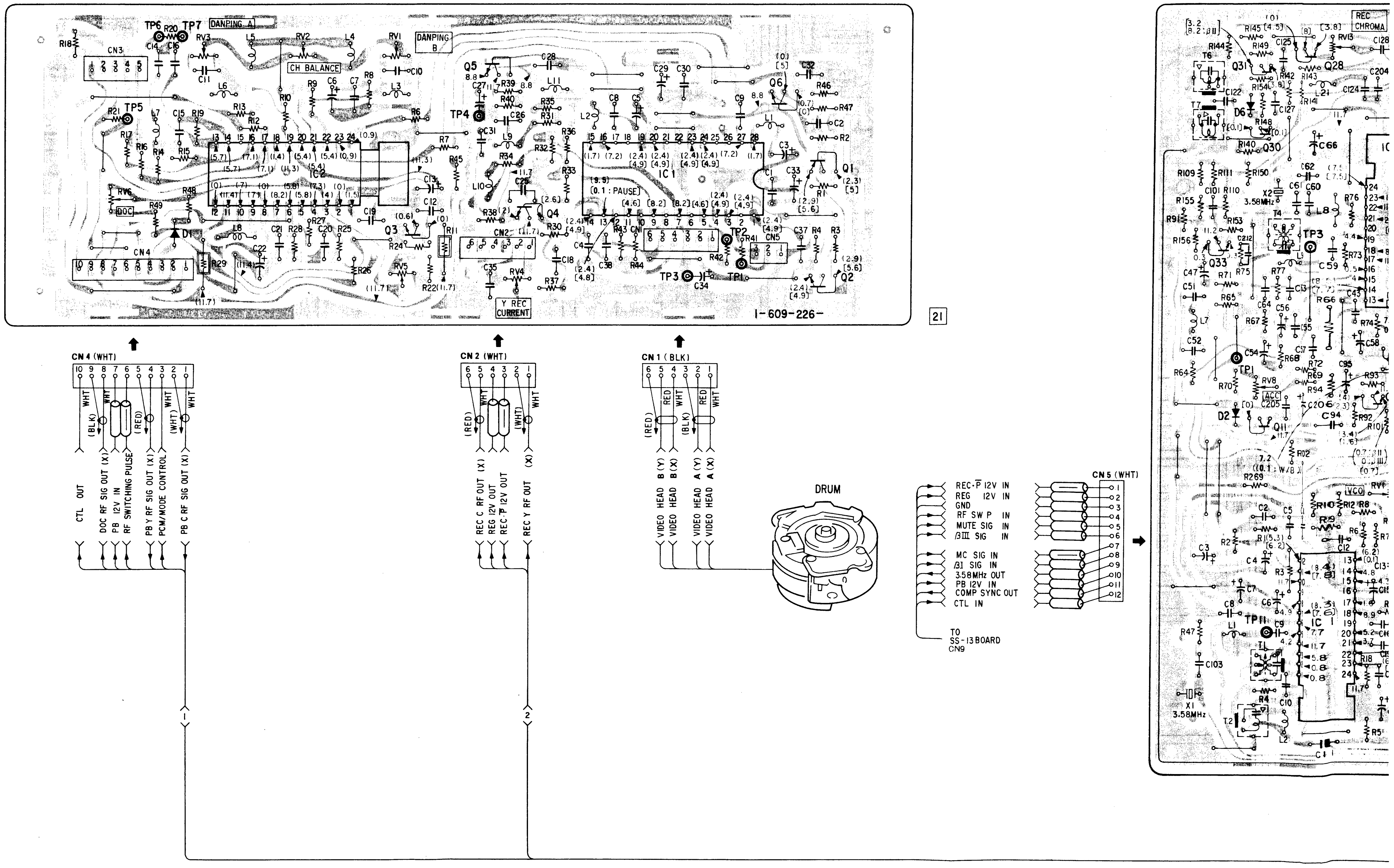
– Ref No. YC-27 BOARD : 1,000 series, RP-8 BOARD : 2,000 series –

	E	F	G	H	I	J	K	L
IC Q			IC2	3	5 4	IC1	6	1 2
D		1						
TP RV		5 RV6 6 7 RV3	RV2	RV1 RV5	4 RV4		3 2 1	

	O	P
IC Q	33 31 30 11	28 IC3 12 IC1
D	6 2	
TP RV	1 RV8 11	3 RV13 RV

[RP-8 BOARD]

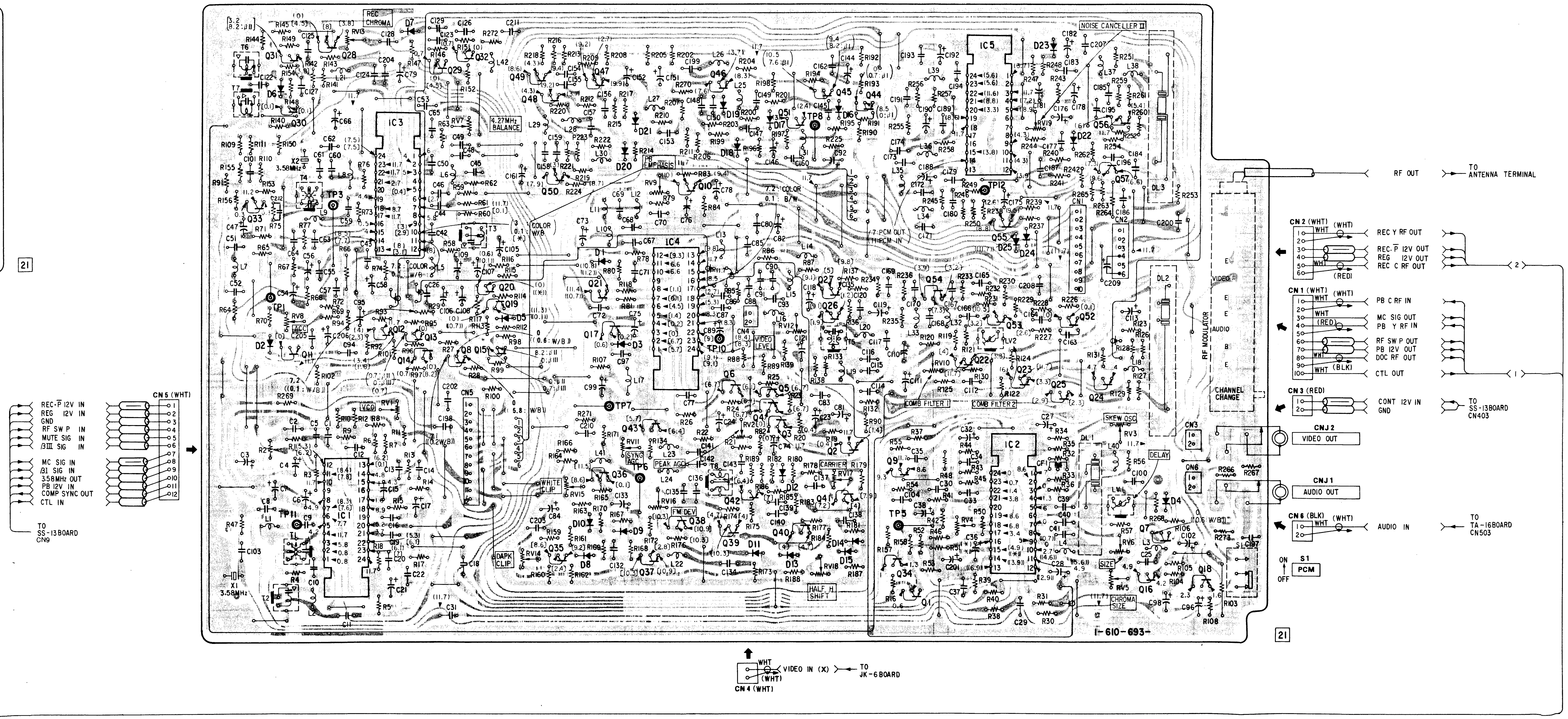
[YC-27 BOARD]

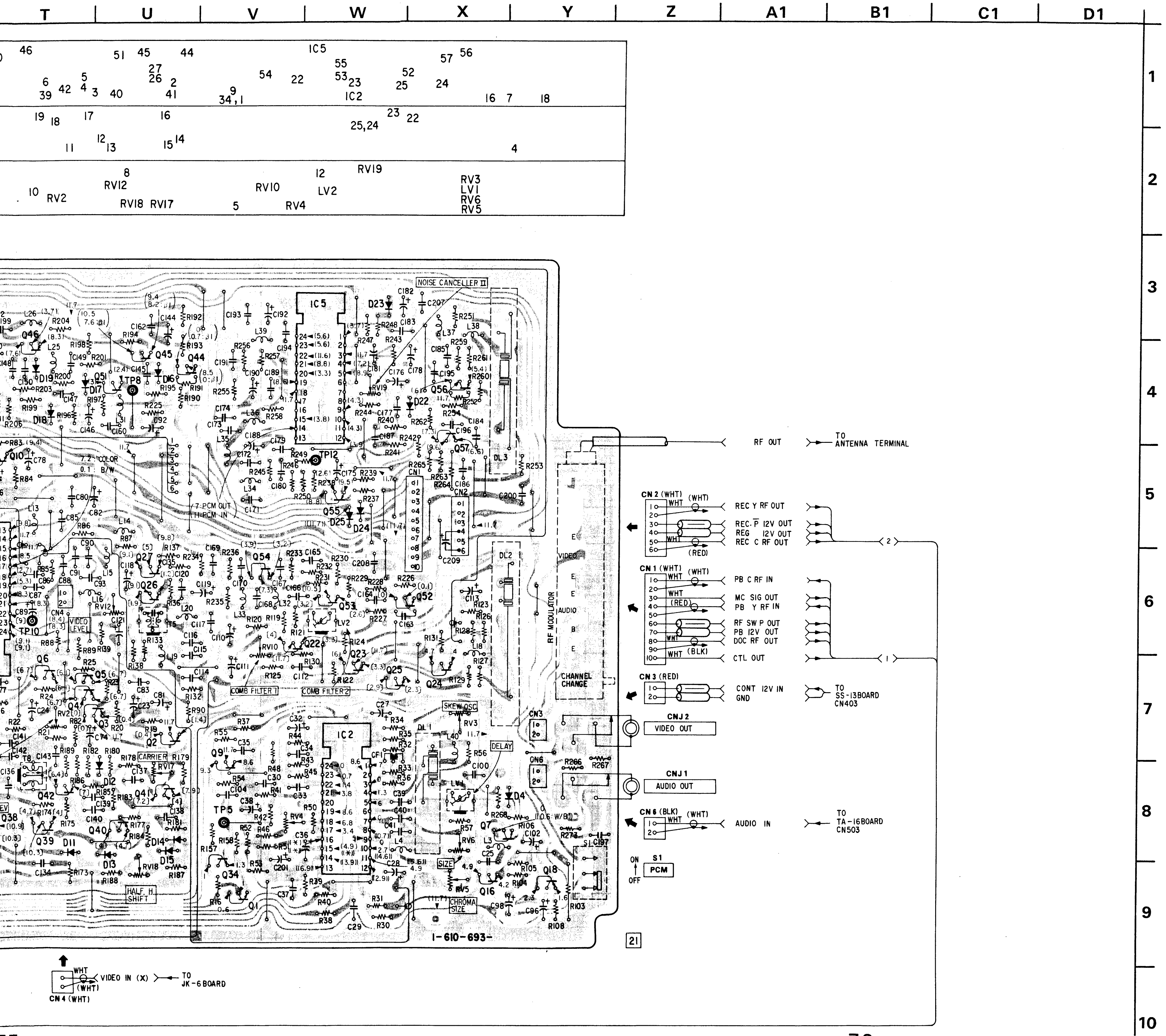

DANPING A
DANPING B
CH BALANCE
Y REC CURRENT
1-609-226-
21
CN4 (WHT)
CTL OUT
DOC RF SIG OUT (X)
PB 12V IN
RF SWITCHING PULSE
PB Y RF SIG OUT (X)
PCM/MODE CONTROL
PB C RF SIG OUT (X)
CN2 (WHT)
REC C RF OUT (X)
REG 12V OUT
REC-P̄ 12V OUT
REC Y RF OUT (X)
CN1 (BLK)
VIDEO HEAD B (Y)
VIDEO HEAD B (X)
VIDEO HEAD A (Y)
VIDEO HEAD A (X)
DRUM
CN5 (WHT)
REC-P̄ 12V IN
REG 12V IN
GND
RF SW P IN
MUTE SIG IN
βIII SIG IN
MC SIG IN
βI SIG IN
3.58MHz OUT
PB 12V IN
COMP SYNC OUT
CTL IN
TO SS-13 BOARD CN9
REC CHROMA
ACC
VCO
X1 3.58MHz
1
2

When indicating parts by reference number, please include the board name.

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A1	B1
IC Q			31 30 33 11	28 12 IC1	IC3 29 32 13 14 8	49 48 50 20,19 15 35	47 21 17 36 43 37 38	10 IC4 46 6 39 42 5 4 3	51 45 44 27 26 2 40 41	9 34,1 54 22	IC5 55 53 23 IC2 25	52 57 56 24 16 7	18			
D			6 2		7	5	1 20 21 3 9 8 10	19 18 17 11	12 13 16 15 14		25,24 23	22	4			
TP RV			1 RV8 11	3 RV13	RV1 RV7	RV14 RV15	7 RV11 6 RV16 RV9	10 RV2	8 RV12 RV18 RV17	5 RV10 RV4	12 LV2 RV19	RV3 LV1 RV6 RV5				

[YC-27 BOARD]


NOISE CANCELLER II
REC CHROMA
4.27MHz BALANCE
PB EMPHASIS
COLOR B/W
COLOR W/B
VIDEO LEVEL
COMB FILTER 1
COMB FILTER 2
SKEW OSC
DELAY
SYNC AGC
PEAK AGC
FM DEV
CARRIER
WHITE CLIP
DARK CLIP
HALF H SHIFT
SIZE
CHROMA SIZE
VCO
ACC
RF MODULATOR
CHANNEL CHANGE
IC1
IC2
IC3
IC4
IC5
CN5 (WHT)
REC·P 12V IN
REG 12V IN
GND
RF SW P IN
MUTE SIG IN
β III SIG IN
MC SIG IN
β1 SIG IN
3.58MHz OUT
PB 12V IN
COMP SYNC OUT
CTL IN
TO SS-13BOARD CN9
RF OUT
TO ANTENNA TERMINAL
CN2 (WHT)
REC Y RF OUT
REC·P 12V OUT
REG 12V OUT
REC C RF OUT
(RED)
CN1 (WHT)
PB C RF IN
MC SIG OUT
PB Y RF IN
RF SW P OUT
PB 12V OUT
DOC RF OUT
CTL OUT
(BLK)
CN3 (RED)
CONT 12V IN
GND
TO SS-13BOARD CN403
CNJ2
VIDEO OUT
CNJ1
AUDIO OUT
CN6 (BLK)
AUDIO IN
TO TA-16BOARD CN503
S1
PCM
ON
OFF
CN4 (WHT)
VIDEO IN (X)
TO JK-6BOARD
1-610-693-
21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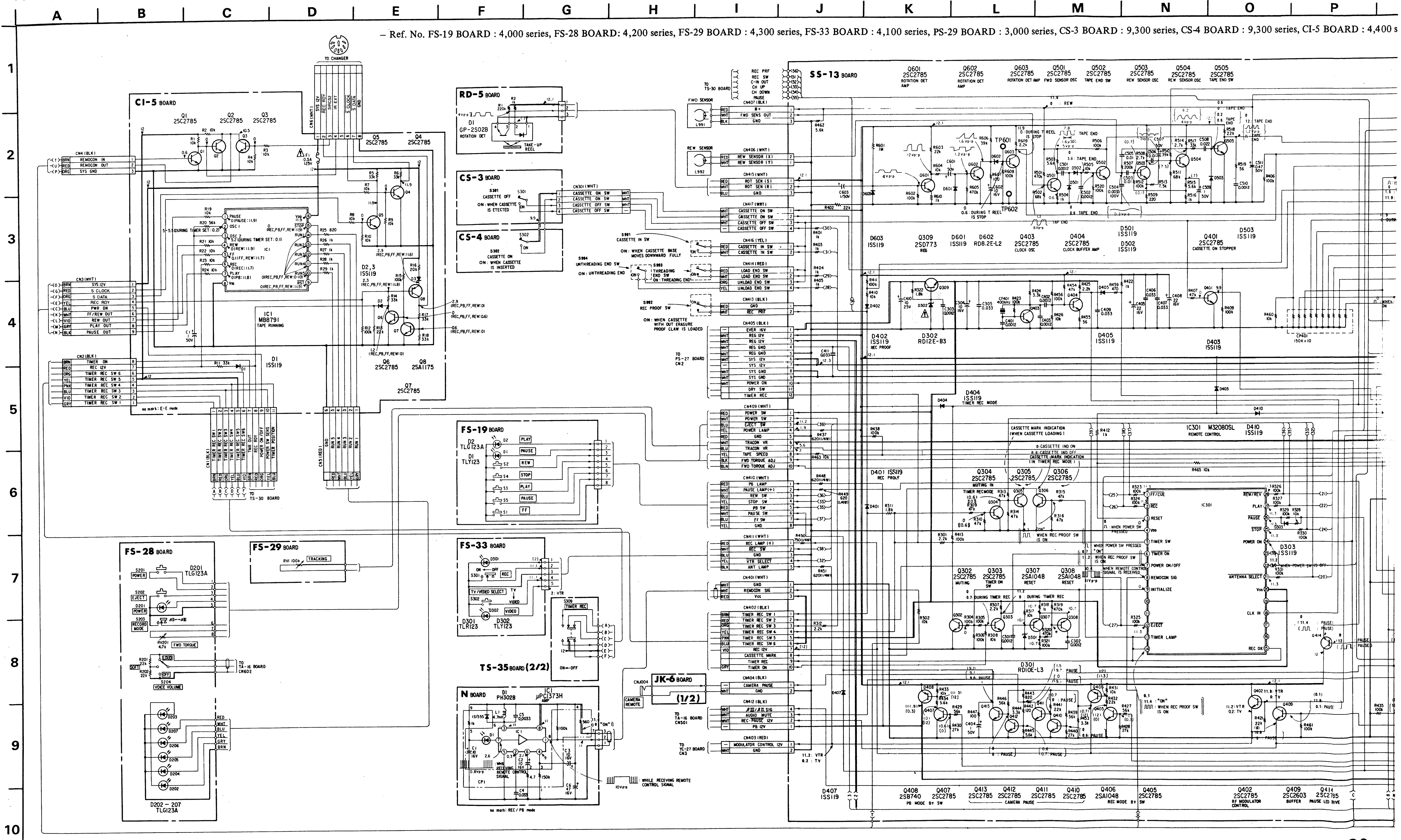
9
10
IC5
IC2
NOISE CANCELLER II
TP8
TP10
TP12
TP5
COMB FILTER 1
COMB FILTER 2
SKEW OSC
DELAY
CARRIER
HALF H SHIFT
SIZE
CHROMA SIZE
VIDEO LEVEL
COLOR
B/W
7 PCM OUT
11 PCM IN
RF MODULATOR
VIDEO
AUDIO
CHANNEL CHANGE
DL1
DL2
DL3
1-610-693-
21
RF OUT
TO ANTENNA TERMINAL
CN2 (WHT)
REC Y RF OUT
REC P 12V OUT
REC 12V OUT
REC C RF OUT
CN1 (WHT)
PB C RF IN
MC SIG OUT
PB Y RF IN
RF SW P OUT
PB 12V OUT
DOC RF OUT
CTL OUT
CN3 (RED)
CONT 12V IN
GND
TO SS-13BOARD CN403
CNJ2
VIDEO OUT
CNJ1
AUDIO OUT
CN6 (BLK)
AUDIO IN
TO TA-16BOARD CN503
S1
PCM
ON
OFF
CN4 (WHT)
VIDEO IN (X)
TO JK-6 BOARD

FS-19 (CASSETTE CONTROL SWITCH), FS-28 (TAPE RUNNING LED, POWER SWITCH), FS-29 (TRACKING VOLUME), FS-33 (REC, TV/VTR SELECT SWITCH), PS-29 (REEL MOTOR DRIVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH), C

– Ref. No. FS-19 BOARD : 4,000 series, FS-28 BOARD: 4,200 series, FS-29 BOARD : 4,300 series, FS-33 BOARD : 4,100 series, PS-29 BOARD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 s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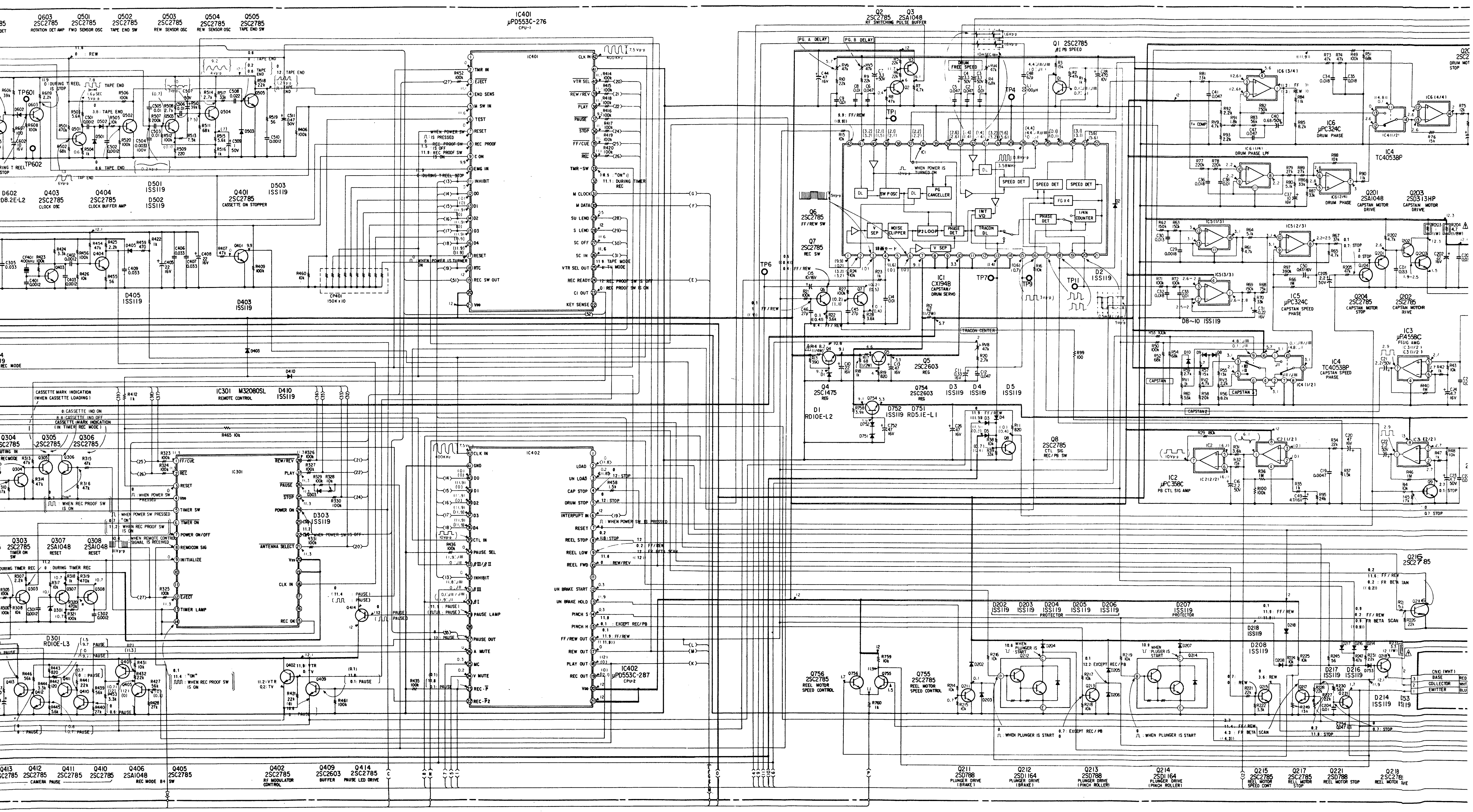
TO CHANGER
CI-5 BOARD
Q1 2SC2785
Q2 2SC2785
Q3 2SC2785
Q4 2SC2785
Q5 2SC2785
IC1 MB8791 TAPE RUNNING
D1 1SS119
D2,3 1SS119
Q6 2SC2785
Q7 2SC2785
Q8 2SA1175
CN4 (BLK)
REMOCON IN
REMOCON OUT
SYS GND
CN3 (WHT)
SYS 12V
S CLOCK
S DATA
REC RDY
PWR ON
FF/REW OUT
REW OUT
PLAY OUT
PAUSE OUT
CN2 (BLK)
TIMER ON
REC 12V
TIMER REC SW 6
TIMER REC SW 5
TIMER REC SW 4
TIMER REC SW 3
TIMER REC SW 2
TIMER REC SW 1
no mark : E-E mode
TO TS-30 BOARD
RD-5 BOARD
D1 GP-2S02B ROTATION DET
TAKE-UP REEL
CS-3 BOARD
S301 CASSETTE OFF
ON : WHEN CASSETTE IS EJECTED
CS-4 BOARD
S302 CASSETTE ON
ON : WHEN CASSETTE IS INSERTED
FS-19 BOARD
D2 TLG123A
D1 TLY123
PLAY
PAUSE
REW
STOP
FF
FS-28 BOARD
S201 POWER
S202 EJECT
D201 POWER
S203 RECORD MODE
RV201 FWD TORQUE
TO TA-16 BOARD CN602
S204 VOICE VOLUME
D202 – 207 TLG123A
FS-29 BOARD
RV1 100k TRACKING
FS-33 BOARD
D301 TLR123
D302 TLY123
S301 REC
S302 TV/VIDEO SELECT
VIDEO
TS-35 BOARD (2/2)
S309 TIMER REC
N BOARD
D1 PH302B
IC1 μPC1373H AMP
WHILE RECEIVING REMOTE CONTROL SIGNAL
no mark : REC / PB mode
JK-6 BOARD (1/2)
CAMERA REMOTE
TO TA-16 BOARD CN501
TO YC-27 BOARD CN3
TO PS-27 BOARD CN2
FWD SENSOR
REW SENSOR
L991
L992
S991 CASSETTE IN SW
ON : WHEN CASSETTE BASE MOVES DOWNWARD FULLY
S994 UNTHREADING END SW
S993 THREADING END SW
S992 REC PROOF SW
ON : WHEN CASSETTE WITH OUT ERASURE PROOF CLAW IS LOADED
SS-13 BOARD
Q601 2SC2785 ROTATION DET AMP
Q602 2SC2785 ROTATION DET AMP
Q603 2SC2785 ROTATION DET AMP
Q501 2SC2785 FWD SENSOR OSC
Q502 2SC2785 TAPE END SW
Q503 2SC2785 REW SENSOR OSC
Q504 2SC2785 REW SENSOR OSC
Q505 2SC2785 TAPE END SW
TP601
TP602
D603 1SS119
Q309 2SD773 REG
D601 1SS119
D602 RD8.2E-L2
Q403 2SC2785 CLOCK OSC
Q404 2SC2785 CLOCK BUFFER AMP
D501 1SS119
D502 1SS119
Q401 2SC2785 CASSETTE ON STOPPER
D503 1SS119
D402 1SS119 REC PROOF
D302 RD12E-B3
D405 1SS119
D403 1SS119
D404 1SS119 TIMER REC MODE
D401 1SS119 REC PROOF
IC301 M32080SL REMOTE CONTROL
D410 1SS119
D303 1SS119
Q304 2SC2785 MUTING IN
Q305 2SC2785
Q306 2SC2785
Q302 2SC2785 MUTING
Q303 2SC2785 TIMER ON SW
Q307 2SA1048 RESET
Q308 2SA1048 RESET
D301 RD10E-L3
D407 1SS119
Q408 2SB740 PB MODE B+ SW
Q407 2SC2785
Q413 2SC2785
Q412 2SC2785 CAMERA PAUSE
Q411 2SC2785
Q410 2SC2785
Q406 2SA1048 REC MODE B+ SW
Q405 2SC2785
Q402 2SC2785 RF MODULATOR CONTROL
Q409 2SC2603 BUFFER
Q414 2SC2785 PAUSE LED DRIVE
FF/CUE
REC
RESET
TIMER SW
POWER ON/OFF
REMOCON SIG
INITIALIZE
EJECT
TIMER LAMP
REW/REV
PLAY
PAUSE
STOP
POWER ON
ANTENNA SELECT
CLK IN
REC OK
CASSETTE MARK INDICATION (WHEN CASSETTE LOADING)
WHEN POWER SW PRESSED
WHEN REC PROOF SW IS ON
WHEN REMOTE CONTROL SIGNAL IS RECEIVED
11.2 : VTR 0.2 : TV

R DRIVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH), CI-5 (CHANGER INTERFACE), N (REMOTE CONTROL SIGNAL SENSOR), RD-5 (ROTATION DETECTOR), SS-13 (SERVO/SYSTEM CONTROL), LM-8 (NOISE FILTER), JK-6 (CAMERA R

L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A1	B1

RD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 series, N BOARD : 9,600 series, RD-5 BOARD : 9,200 series, SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD: 9,000 series, REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –


Q603 2SC2785 ROTATION DET AMP
Q501 2SC2785 FWD SENSOR OSC
Q502 2SC2785 TAPE END SW
Q503 2SC2785 REW SENSOR OSC
Q504 2SC2785 REW SENSOR OSC
Q505 2SC2785 TAPE END SW
IC401 μPD553C-276 CPU-1
Q2 2SC2785
Q3 2SA1048 RF SWITCHING PULSE BUFFER
Q1 2SC2785 PB SPEED
TP601
TP602
D602 RD8.2E-L2
Q403 2SC2785 CLOCK OSC
Q404 2SC2785 CLOCK BUFFER AMP
D501 1SS119
D502 1SS119
Q401 2SC2785 CASSETTE ON STOPPER
D503 1SS119
D405 1SS119
D403 1SS119
CF401 400kHz
CP401 150K×10
IC1 CX194B CAPSTAN/DRUM SERVO
Q6 2SC2785 FF/REW SW
Q7 2SC2785 REC SW
TP1
TP4
TP6
TP7
TP9
TP11
D2 1SS119
DRUM FREE SPEED
TRACON CENTER
IC6 μPC324C DRUM PHASE
IC4 TC4053BP
Q201 2SA1048 CAPSTAN MOTOR DRIVE
Q203 2SD313HP CAPSTAN MOTOR DRIVE
IC5 μPC324C CAPSTAN SPEED PHASE
Q204 2SC2785 CAPSTAN MOTOR STOP
Q202 2SC2785 CAPSTAN MOTOR DRIVE
D8~10 1SS119
IC3 μPC4558C
IC4 TC4053BP CAPSTAN SPEED PHASE
Q4 2SC1475 REG
Q5 2SC2603 REG
Q754 2SC2603 REG
D3 1SS119
D4 1SS119
D5 1SS119
D1 RD10E-L2
D752 1SS119
D751 RD5.1E-L1
Q8 2SC2785 CTL SIG REC/PB SW
IC2 μPC358C PB CTL SIG AMP
CASSETTE MARK INDICATION (WHEN CASSETTE LOADING)
IC301 M32080SL REMOTE CONTROL
D410 1SS119
Q304 2SC2785
Q305 2SC2785
Q306 2SC2785
Q303 2SC2785 TIMER ON SW
Q307 2SA1048 RESET
Q308 2SA1048 RESET
D303 1SS119
IC402 μPD553C-287 CPU-2
D301 RD10E-L3
Q413 2SC2785
Q412 2SC2785 CAMERA PAUSE
Q411 2SC2785
Q410 2SC2785
Q406 2SA1048 REC MODE B+ SW
Q405 2SC2785
Q402 2SC2785 RF MODULATOR CONTROL
Q409 2SC2603 BUFFER
Q414 2SC2785 PAUSE LED DRIVE
D202 1SS119
D203 1SS119
D204 1SS119 PROTECTOR
D205 1SS119
D206 1SS119
D207 1SS119 PROTECTOR
D218 1SS119
D208 1SS119
D217 1SS119
D216 1SS119
D214 1SS119
D53 1SS119
Q216 2SC2785
Q756 2SC2785 REEL MOTOR SPEED CONTROL
Q755 2SC2785 REEL MOTOR SPEED CONTROL
Q211 2SD788 PLUNGER DRIVE (BRAKE)
Q212 2SD1164 PLUNGER DRIVE (BRAKE)
Q213 2SD788 PLUNGER DRIVE (PINCH ROLLER)
Q214 2SD1164 PLUNGER DRIVE (PINCH ROLLER)
Q215 2SC2785 REEL MOTOR SPEED CONT
Q217 2SC2785 RELL MOTOR STOP
Q221 2SD788 REEL MOTOR STOP
Q218 2SC2785 REEL MOTOR DRIVE
CN10 (WHT) BASE RED COLLECTOR WHT EMITTER BLU

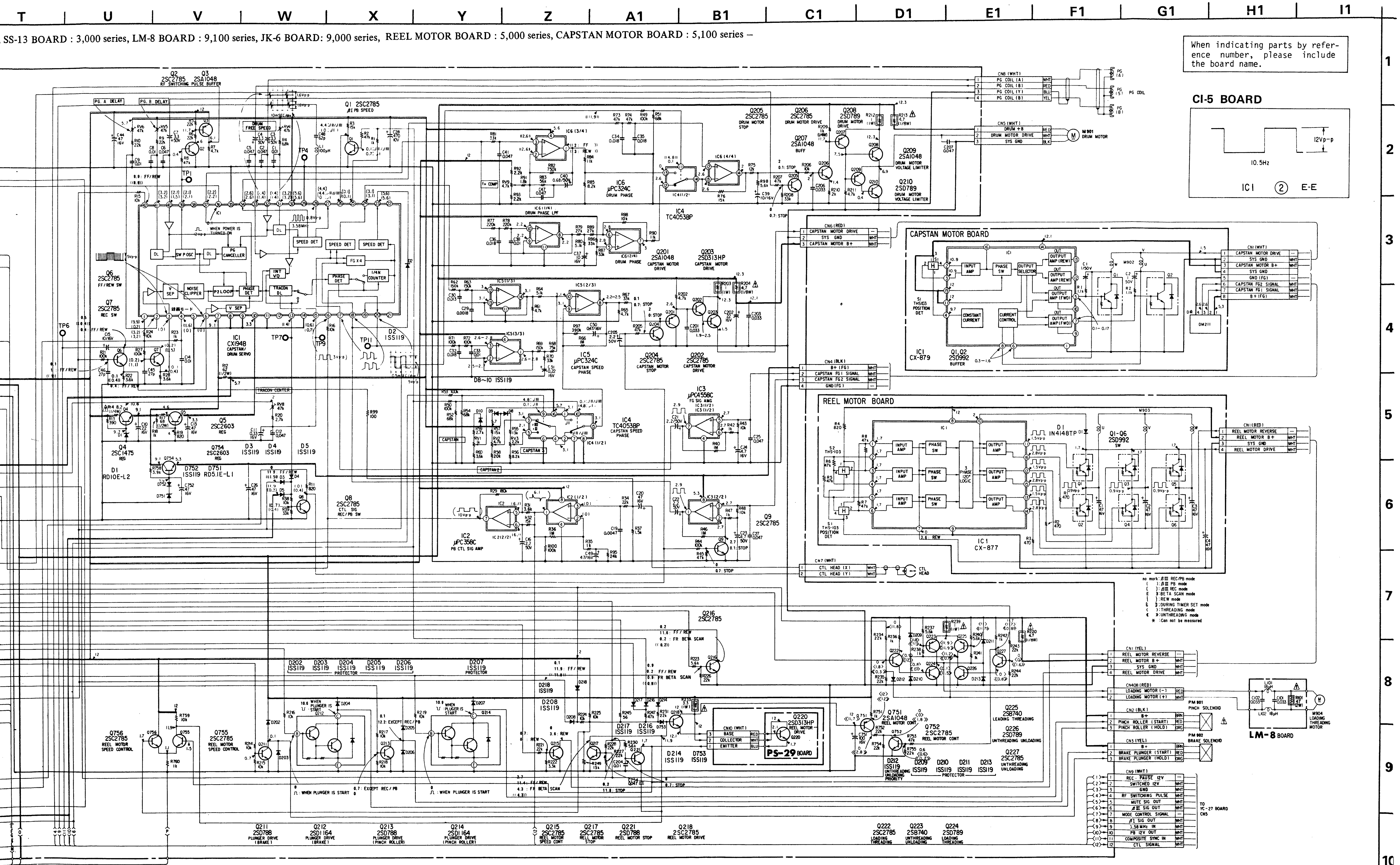
SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL

SCHEMATIC DIAGRAM

NTROL SIGNAL SENSOR), RD-5 (ROTATION DETECTOR), SS-13 (SERVO/SYSTEM CONTROL), LM-8 (NOISE FILTER), JK-6 (CAMERA REMOTE), TS-35 (TIMER SWITCH), REEL MOTOR (REEL MOTOR), CAPSTAN MOTOR (CAPSTAN MOTOR)

SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD: 9,000 series, REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –

When indicating parts by reference number, please include the board name.


T
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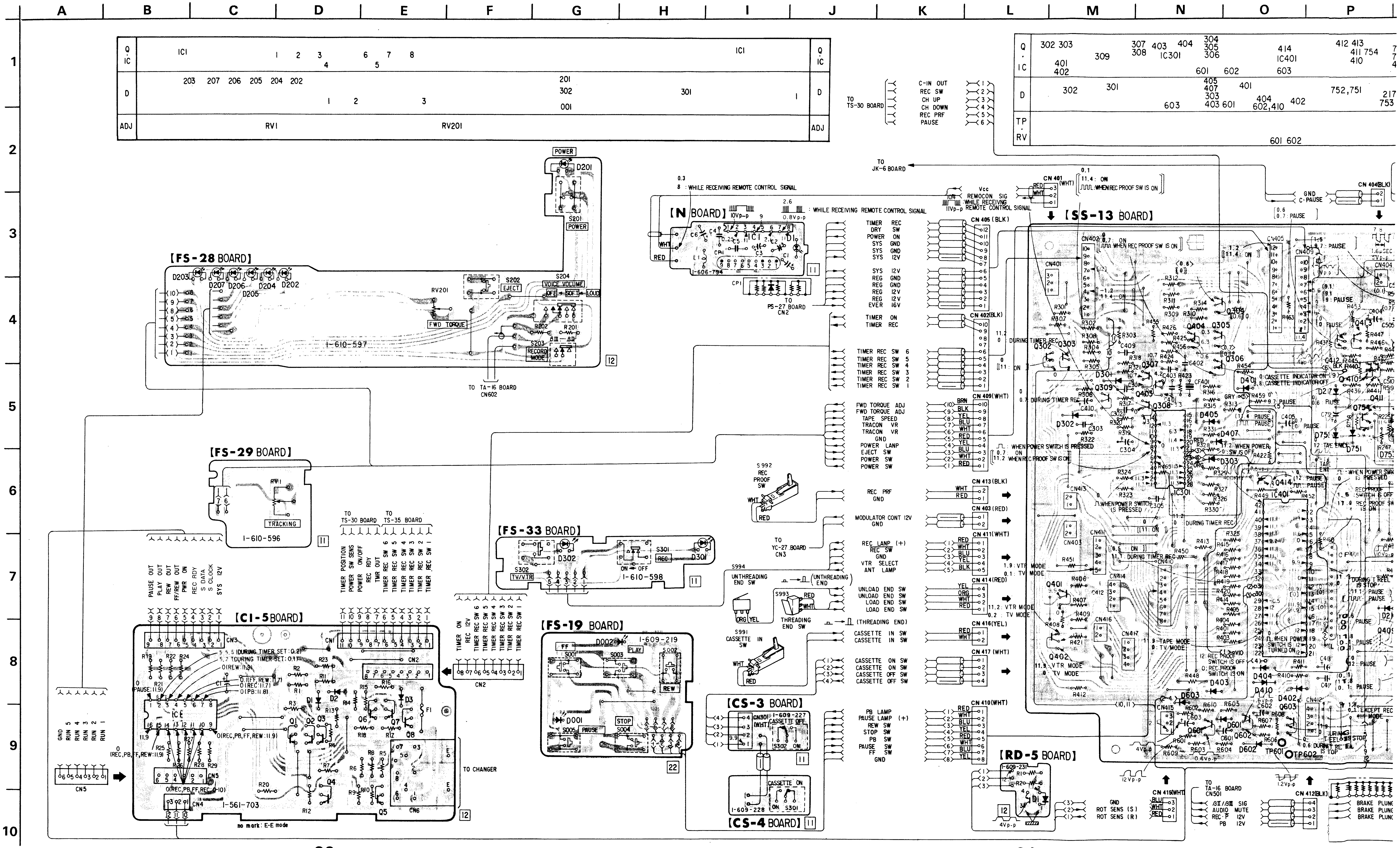
10
CI-5 BOARD
12Vp-p
10.5Hz
IC1 ② E-E
CAPSTAN MOTOR BOARD
REEL MOTOR BOARD
LM-8 BOARD
PS-29 BOARD
IC1 CX194B CAPSTAN/DRUM SERVO
IC2 μPC358C PB CTL SIG AMP
IC3 μPC4558C FG SIG AMP
IC4 TC4053BP
IC5 μPC324C CAPSTAN SPEED PHASE
IC6 μPC324C DRUM PHASE
IC1 CX-879
IC1 CX-877
Q1 2SC2785 β1 PB SPEED
Q2 2SC2785 Q3 2SA1048 RF SWITCHING PULSE BUFFER
Q4 2SC1475 REG
Q5 2SC2603 REG
Q6 2SC2785 FF/REW SW
Q7 2SC2785 REC SW
Q8 2SC2785 CTL SIG REC/PB SW
Q9 2SC2785
Q201 2SA1048 CAPSTAN MOTOR DRIVE
Q202 2SC2785 CAPSTAN MOTOR DRIVE
Q203 2SD313HP CAPSTAN MOTOR DRIVE
Q204 2SC2785 CAPSTAN MOTOR STOP
Q205 2SC2785 DRUM MOTOR STOP
Q206 2SC2785 DRUM MOTOR DRIVE
Q207 2SA1048 BUFF
Q208 2SD789 DRUM MOTOR DRIVE
Q209 2SA1048 DRUM MOTOR VOLTAGE LIMITER
Q210 2SD789 DRUM MOTOR VOLTAGE LIMITER
Q211 2SD788 PLUNGER DRIVE (BRAKE)
Q212 2SD1164 PLUNGER DRIVE (BRAKE)
Q213 2SD788 PLUNGER DRIVE (PINCH ROLLER)
Q214 2SD1164 PLUNGER DRIVE (PINCH ROLLER)
Q215 2SC2785 REEL MOTOR SPEED CONT
Q216 2SC2785
Q217 2SC2785 REEL MOTOR STOP
Q218 2SC2785 REEL MOTOR DRIVE
Q220 2SD313HP REEL MOTOR DRIVE
Q221 2SD788 REEL MOTOR STOP
Q222 2SC2785 LOADING THREADING
Q223 2SB740 UNTHREADING UNLOADING
Q224 2SD789 LOADING THREADING
Q225 2SB740 LEADING THREADING
Q226 2SD789 UNTHREADING UNLOADING
Q227 2SC2785 UNTHREADING UNLOADING
Q751 2SA1048 REEL MOTOR CONT
Q752 2SC2785 REEL MOTOR CONT
Q755 2SC2785 REEL MOTOR SPEED CONTROL
Q756 2SC2785 REEL MOTOR SPEED CONTROL
D1 RD10E-L2
D751 RD5.1E-L1
Q1, Q2 2SD992 BUFFER
Q1-Q6 2SD992 SW
D1 1N4148TP
M901 DRUM MOTOR
M902
M903
M904 LOADING THREADING MOTOR
PM901 PINCH SOLENOID
PM902 BRAKE SOLENOID
CTL HEAD
PG COIL
CN8 (WHT) PG COIL (A) PG COIL (B) PG COIL (Y) PG COIL (B)
CN5 (WHT) DRUM +B DRUM MOTOR DRIVE SYS GND
CN6 (RED) CAPSTAN MOTOR DRIVE SYS GND CAPSTAN MOTOR B+
CN4 (BLK) B+ (FG1) CAPSTAN FG1 SIGNAL CAPSTAN FG2 SIGNAL GND (FG)
CN7 (WHT) CTL HEAD (X) CTL HEAD (Y)
CN1 (YEL) REEL MOTOR REVERSE REEL MOTOR B+ SYS GND REEL MOTOR DRIVE
CN408 (RED) LOADING MOTOR (-) LOADING MOTOR (+)
CN2 (BLK) B+ PINCH ROLLER (START) PINCH ROLLER (HOLD)
CN3 (YEL) B+ BRAKE PLUNGER (START) BRAKE PLUNGER (HOLD)
CN9 (WHT) REC · PAUSE 12V SWITCHED 12V GND RF SWITCHING PULSE MUTE SIG OUT βII SIG OUT MODE CONTROL SIGNAL β1 SIG OUT 3.58MHz IN PB 12V OUT COMPOSITE SYNC IN CTL SIGNAL
TO YC-27 BOARD CN5
no mark : βIII REC/PB mode
( ) : βIII PB mode
[ ] : βIII REC mode
(( )) : BETA SCAN mode
{ } : REW mode
⟦ ⟧ : DURING TIMER SET mode
⟨ ⟩ : THREADING mode
《 》 : UNTHREADING mode
* : Can not be measured

SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL

FS-19 (CASSETTE CONTROL SWITCH), FS-28 (TAPE RUNNING LED, POWER SWITCH), FS-29 (TRACKING VOLUME), FS-33 (REC, TV/VTR SELECT SWITCH), PS-29 (REEL MOTOR DRIVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH)



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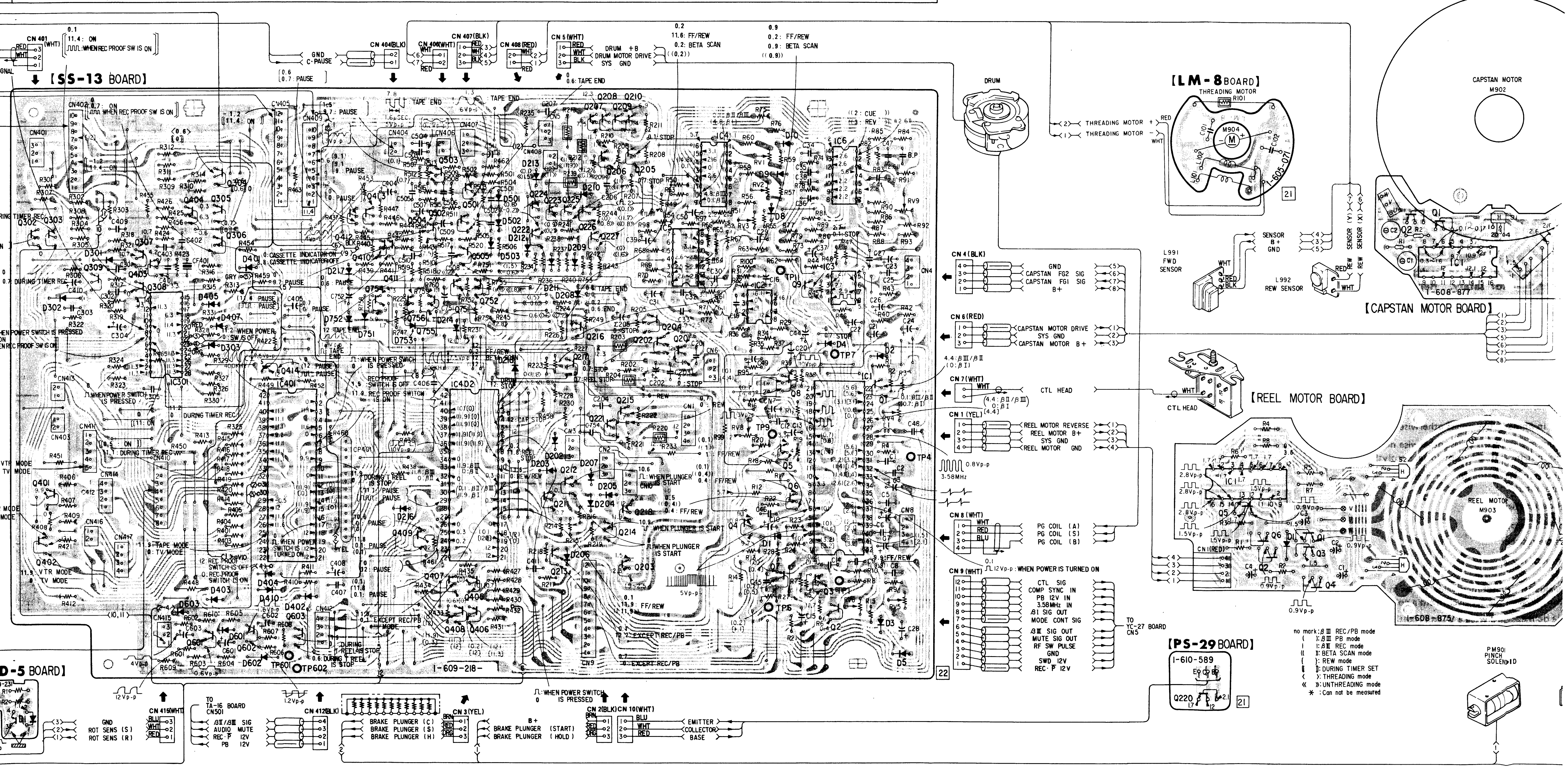
[FS-28 BOARD]
1-610-597
POWER
S201
RV201
FWD TORQUE
S202 EJECT
S204 VOICE VOLUME
S203 RECORD MODE
TO TA-16 BOARD CN602
[N BOARD]
1-606-794
TO PS-27 BOARD CN2
TO JK-6 BOARD
TO TS-30 BOARD
[FS-29 BOARD]
1-610-596
TRACKING
[FS-33 BOARD]
1-610-598
S302 TV/VTR
S301 REC
[CI-5 BOARD]
1-561-703
TO CHANGER
no mark: E-E mode
[FS-19 BOARD]
1-609-219
FF
PLAY
REW
PAUSE
STOP
[CS-3 BOARD]
1-609-227
CASSETTE OFF
[CS-4 BOARD]
1-609-228
CASSETTE ON
S301
[RD-5 BOARD]
1-609-231
ROT SENS (S)
ROT SENS (R)
[SS-13 BOARD]
IC301
IC401
TO TA-16 BOARD CN501
TO YC-27 BOARD CN3
TO TS-30 BOARD
TO TS-35 BOARD
S991 CASSETTE IN SW
S992 REC PROOF SW
S993 THREADING END SW
S994 UNTHREADING END SW
BRAKE PLUNGER

IVE), CS-3 (CASSETTE OFF SWITCH), CS-4 (CASSETTE ON SWITCH), CI-5 (CHANGER INTERFACE), N (REMOTE CONTROL SIGNAL SENSOR), RD-5 (ROTATION DETECTOR), SS-13 (SERVO/SYSTEM CONTROL), LM-8 (NOISE FILTER), JK-6 (CAMERA REMOT

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A1	B1
Q · IC	302 303 309 401 402	307 403 404 304 308 IC301 305 306 601	602 414 IC401 603	412 413 411 754 410	755 503 501 756 504 502 409 505 751 407 405 408 406 752 IC402	224 223 225 226 207,208,209,210 222 216 211 217 213 212	206 227 205 221 215 204 202 214 218 203 IC5 201	IC4 IC2 4 8 5 7	9 6 3 2 IC6 IC3 IC1 1							
D	302 301	603 405 407 303 403	601 401 404 602,410 402	752,751 217 753	216 503,214,502 501	213 212 211 218 202 210 209 208 203 206	207 204 205	1	9 10 8 4	2 3 5						
TP · RV			601 602					RV1 RV3 RV2 RV8 6 9	11 7 1 RV6	RV9 RV4 4 RV5						

– Ref. No. FS-19 BOARD : 4,000 series, FS-28 BOARD : 4,200 series, FS-29 BOARD : 4,300 series, FS-33 BOARD : 4,1
PS-29 BOARD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 series, N I
RD-5 BOARD : 9,200 series, SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD : 9,000 series,
REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –

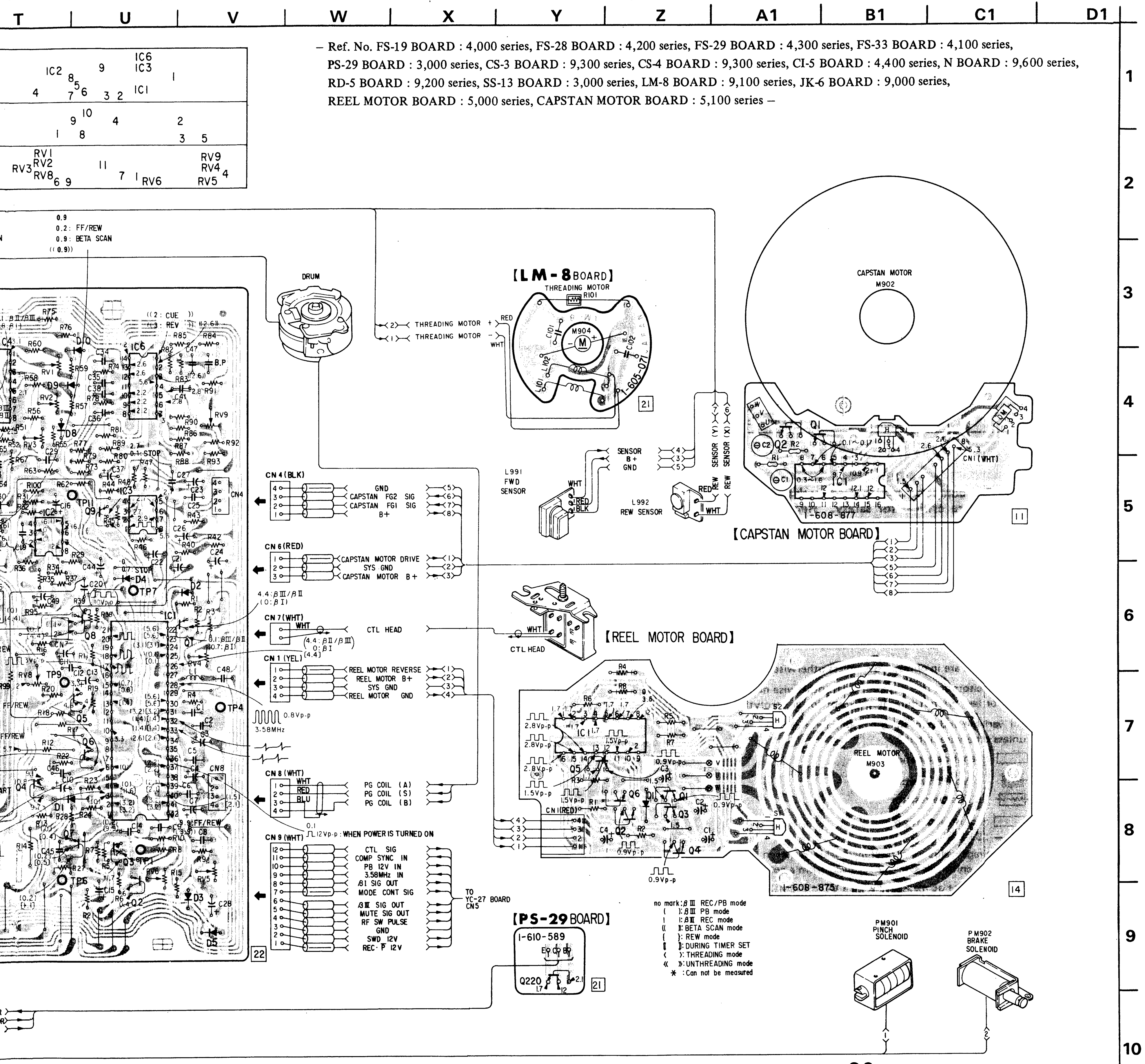


【SS-13 BOARD】
【LM-8 BOARD】
【CAPSTAN MOTOR BOARD】
【REEL MOTOR BOARD】
【PS-29 BOARD】
D-5 BOARD】
DRUM
THREADING MOTOR
R101
M904
CAPSTAN MOTOR
M902
REEL MOTOR
M903
PM901
PINCH SOLENOID
CTL HEAD
L991 FWD SENSOR
L992 REW SENSOR
SENSOR B+ GND
CN 401 (WHT)
CN 404 (BLK)
CN 406 (WHT)
CN 407 (BLK)
CN 408 (RED)
CN 5 (WHT)
DRUM +B
DRUM MOTOR DRIVE
SYS GND
CN 4 (BLK)
GND
CAPSTAN FG2 SIG
CAPSTAN FG1 SIG
B+
CN 6 (RED)
CAPSTAN MOTOR DRIVE
SYS GND
CAPSTAN MOTOR B+
CN 7 (WHT)
CN 1 (YEL)
REEL MOTOR REVERSE
REEL MOTOR B+
SYS GND
REEL MOTOR GND
CN 8 (WHT)
PG COIL (A)
PG COIL (S)
PG COIL (B)
CN 9 (WHT)
CTL SIG
COMP SYNC IN
PB 12V IN
3.58MHz IN
β1 SIG OUT
MODE CONT SIG
βⅢ SIG OUT
MUTE SIG OUT
RF SW PULSE
GND
SWD 12V
REC·P 12V
TO YC-27 BOARD CN5
CN 416 (WHT)
GND
ROT SENS (S)
ROT SENS (R)
TO TA-16 BOARD CN501
βⅡ/βⅢ SIG
AUDIO MUTE
REC·P 12V
PB 12V
CN 412 (BLK)
CN 3 (YEL)
BRAKE PLUNGER (C)
BRAKE PLUNGER (S)
BRAKE PLUNGER (H)
B+
BRAKE PLUNGER (START)
BRAKE PLUNGER (HOLD)
CN 2 (BLK)
CN 10 (WHT)
EMITTER
COLLECTOR
BASE
THREADING MOTOR +
THREADING MOTOR −
1-609-218-
1-605-071
1-608-877
1-608-875
1-610-589
Q220
IC401
IC402
IC301
IC1
IC2
IC3
IC4
IC5
IC6
TP1
TP4
TP5
TP7
TP9
TP11
TP601
TP602
WHEN POWER SWITCH IS PRESSED
WHEN PLUNGER IS START
FF/REW
TAPE END
PAUSE
DURING TIMER REC
VTR MODE
TV MODE
CASSETTE INDICATOR ON
CASSETTE INDICATOR OFF
no mark: βⅢ REC/PB mode
( ): βⅡ PB mode
[ ]: βⅡ REC mode
(( )): BETA SCAN mode
[[ ]]: DURING TIMER SET
{ }: REW mode
< >: THREADING mode
<< >>: UNTHREADING mode
*: Can not be measured
21
22

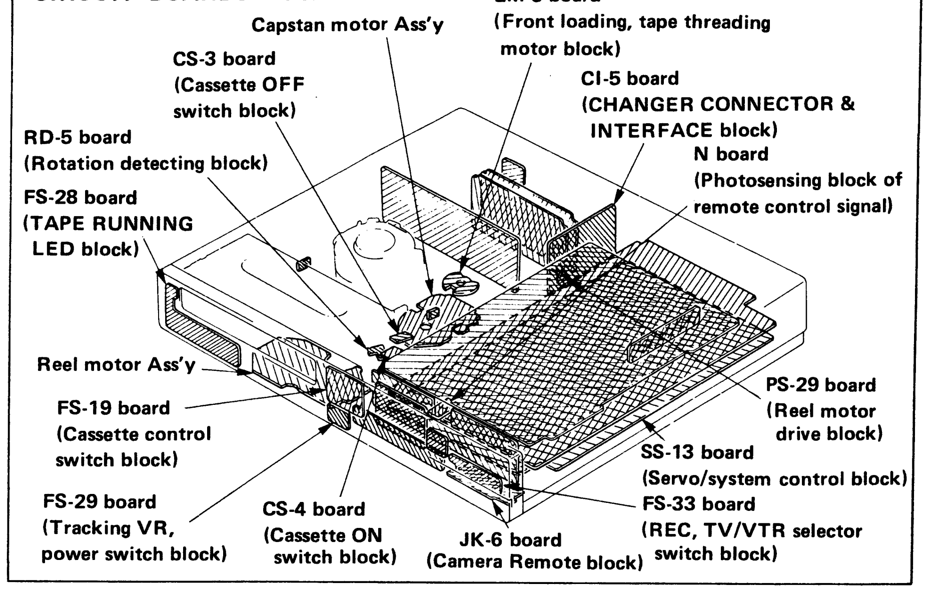
SCHEMATIC DIAGRAM

ROL SIGNAL SENSOR), RD-5 (ROTATION DETECTOR), SS-13 (SERVO/SYSTEM CONTROL), LM-8 (NOISE FILTER), JK-6 (CAMERA REMOTE), TS-35 (TIMER SWITCH), REEL MOTOR (REEL MOTOR), CAPSTAN MOTOR (CAPSTAN MOTOR)

– Ref. No. FS-19 BOARD : 4,000 series, FS-28 BOARD : 4,200 series, FS-29 BOARD : 4,300 series, FS-33 BOARD : 4,100 series, PS-29 BOARD : 3,000 series, CS-3 BOARD : 9,300 series, CS-4 BOARD : 9,300 series, CI-5 BOARD : 4,400 series, N BOARD : 9,600 series, RD-5 BOARD : 9,200 series, SS-13 BOARD : 3,000 series, LM-8 BOARD : 9,100 series, JK-6 BOARD : 9,000 series, REEL MOTOR BOARD : 5,000 series, CAPSTAN MOTOR BOARD : 5,100 series –


T
U
V
W
X
Y
Z
A1
B1
C1
D1
1
2
3
4
5
6
7
8
9
10
IC6
IC3
IC2
IC1
RV1
RV2
RV3
RV8
RV9
RV4
RV5
RV6
0.2: FF/REW
0.9: BETA SCAN
DRUM
[LM-8 BOARD]
THREADING MOTOR
M904
THREADING MOTOR
RED
WHT
1-605-071
21
CAPSTAN MOTOR
M902
SENSOR
B+
GND
SENSOR (Y)
SENSOR (X)
REW
REW
L991
FWD
SENSOR
L992
REW SENSOR
1-608-877
CN1 (WHT)
[CAPSTAN MOTOR BOARD]
11
CN 4 (BLK)
GND
CAPSTAN FG2 SIG
CAPSTAN FG1 SIG
B+
CN 6 (RED)
CAPSTAN MOTOR DRIVE
SYS GND
CAPSTAN MOTOR B+
4.4: βIII/βII
(0: βI)
CN 7 (WHT)
WHT
CTL HEAD
(4.4: βII/βIII
0: βI
[4.4]
CTL HEAD
[REEL MOTOR BOARD]
CN 1 (YEL)
REEL MOTOR REVERSE
REEL MOTOR B+
SYS GND
REEL MOTOR GND
0.8Vp-p
3.58MHz
CN 8 (WHT)
WHT
RED
BLU
PG COIL (A)
PG COIL (S)
PG COIL (B)
0.1
12Vp-p : WHEN POWER IS TURNED ON
CN 9 (WHT)
CTL SIG
COMP SYNC IN
PB 12V IN
3.58MHz IN
βI SIG OUT
MODE CONT SIG
βIII SIG OUT
MUTE SIG OUT
RF SW PULSE
GND
SWD 12V
REC · P̄ 12V
TO
YC-27 BOARD
CN5
22
REEL MOTOR
M903
1-608-875
14
2.8Vp-p
1.5Vp-p
0.9Vp-p
[PS-29 BOARD]
1-610-589
Q220
21
no mark : βIII REC/PB mode
( ) : βIII PB mode
| | : βII REC mode
(( )) : BETA SCAN mode
{ } : REW mode
【 】 : DURING TIMER SET
< > : THREADING mode
« » : UNTHREADING mode
* : Can not be measured
PM901
PINCH
SOLENOID
PM902
BRAKE
SOLENOID

CIRCUIT BOARDS LOCATION


LM-8 board
(Front loading, tape threading motor block)
Capstan motor Ass'y
CS-3 board
(Cassette OFF switch block)
CI-5 board
(CHANGER CONNECTOR & INTERFACE block)
N board
(Photosensing block of remote control signal)
RD-5 board
(Rotation detecting block)
FS-28 board
(TAPE RUNNING LED block)
Reel motor Ass'y
FS-19 board
(Cassette control switch block)
PS-29 board
(Reel motor drive block)
SS-13 board
(Servo/system control block)
FS-33 board
(REC, TV/VTR selector switch block)
FS-29 board
(Tracking VR, power switch block)
CS-4 board
(Cassette ON switch block)
JK-6 board
(Camera Remote block)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

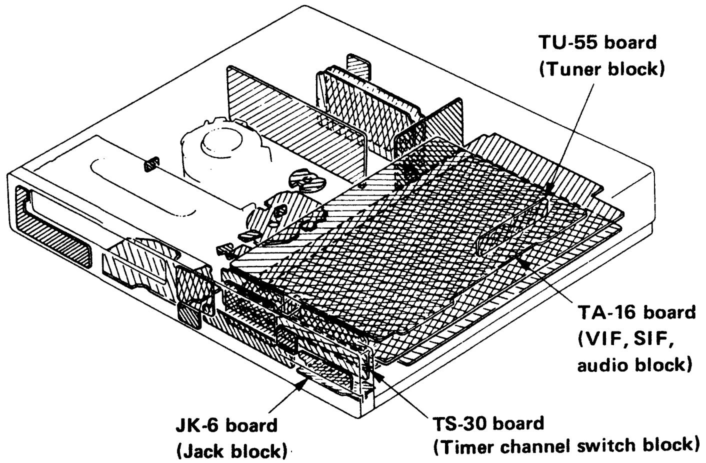
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- -▭- : Nonflammable resistor
- -▭- : Fusible resistor
- ▭ : adjustment for repair.
- —— : B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- All voltages are dc measured with a VOM (10MΩ).

When indicating parts by reference number, please include the board name.

TA-16 (VIF, SIF, AFT, AGC), TU-55 (TUNER), JK-6 (JACK), TS-30 (TIMER CHANNEL SWITCH) SCHEMATIC DIAGRAM

– Ref. No. TA-16 BOARD : 6,000 series, TU-55 BOARD : 6,000 series, JK-6 BOARD : 9,000 series, TS-30 BOARD : 8,000 series –

CIRCUIT BOARDS LOCATION

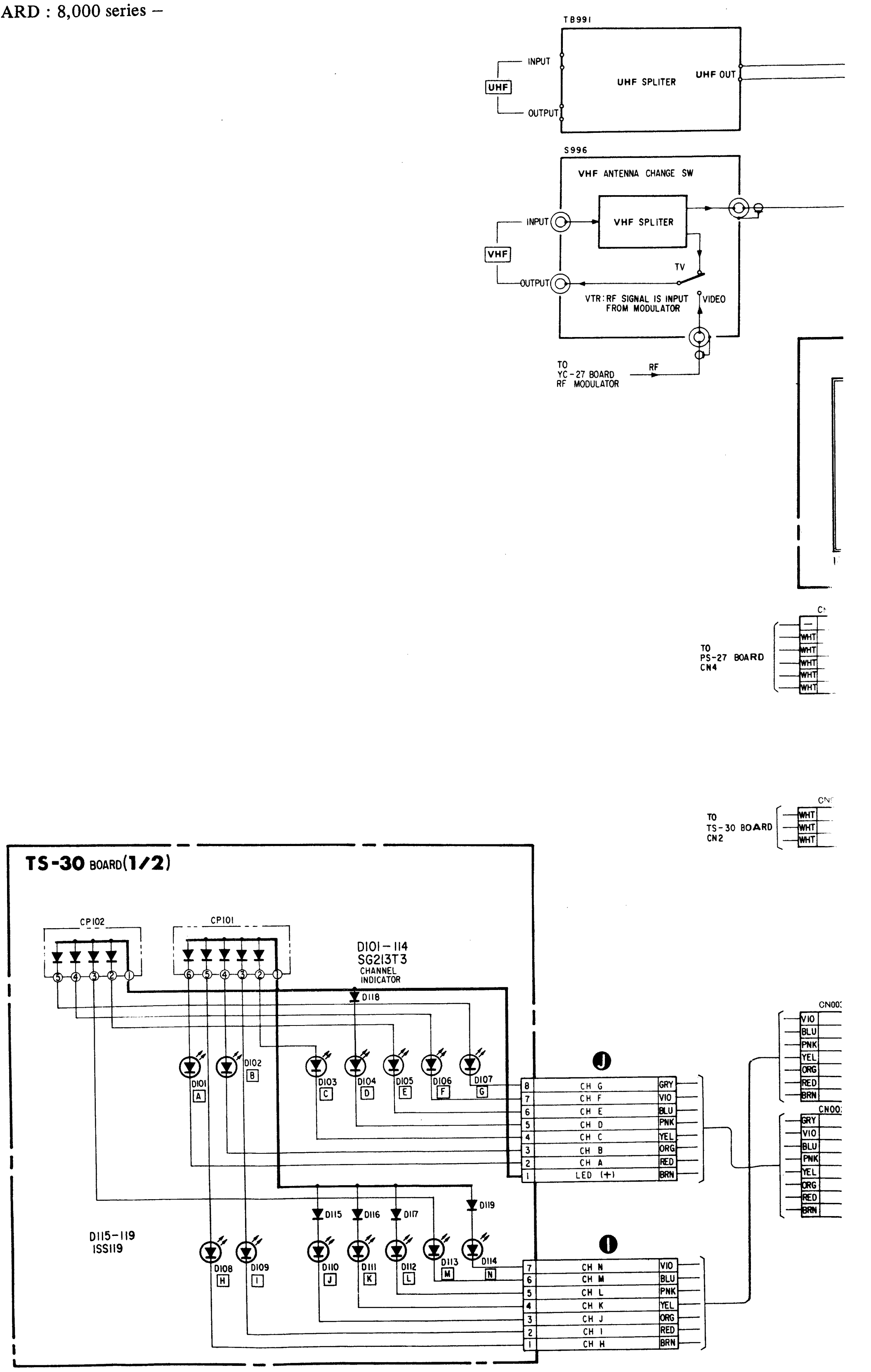

TU-55 board
(Tuner block)
TA-16 board
(VIF, SIF,
audio block)
JK-6 board
(Jack block)
TS-30 board
(Timer channel switch block)

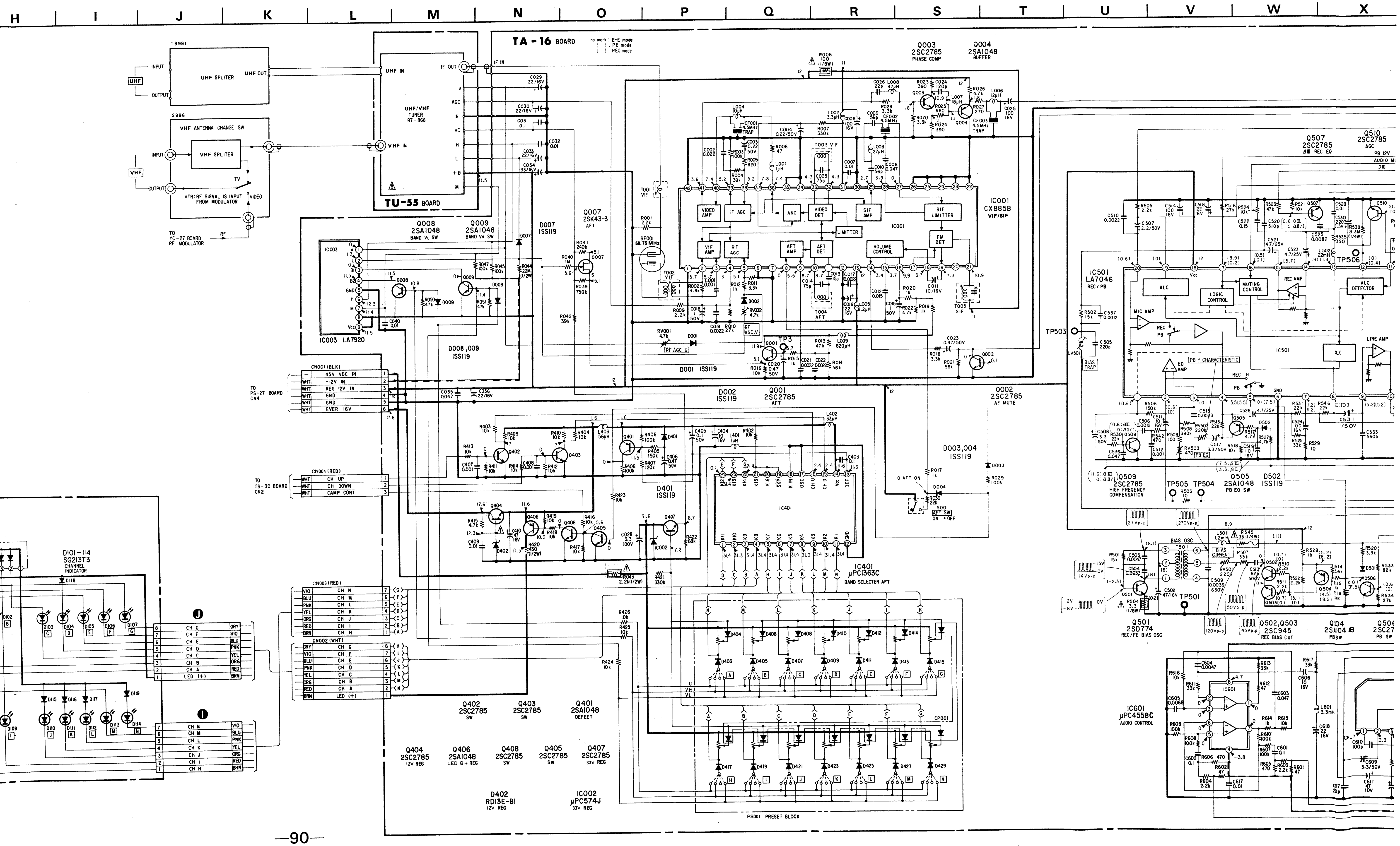
Note: **The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

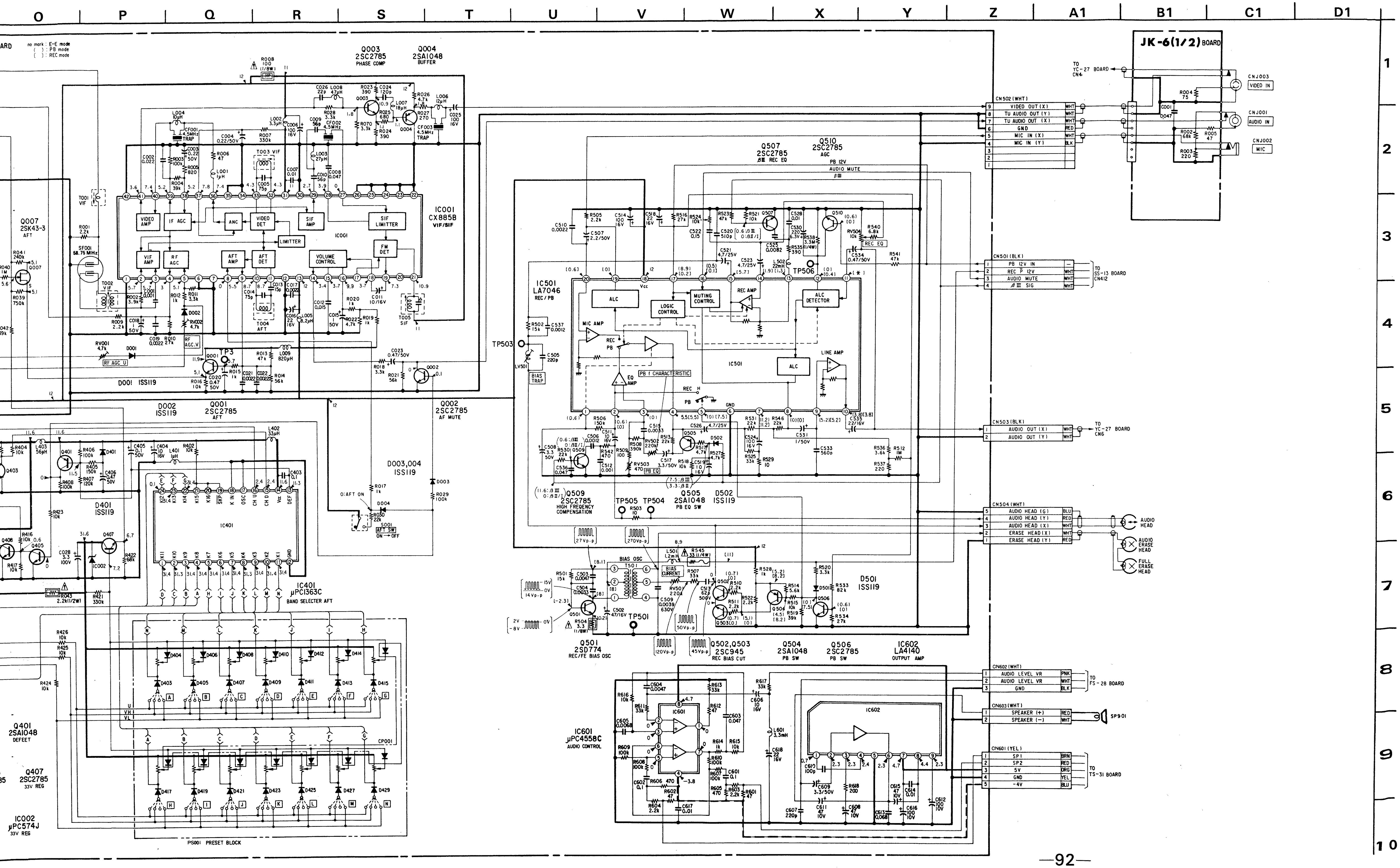
Note: **Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.**

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ☐ : panel designation.
- ▨ : Nonflammable resistor
- ∿ : Fusible resistor
- ☐ : adjustment for repair.
- —— : B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- All voltages are dc measured with a VOM (10MΩ).

When indicating parts by reference number, please include the board name.

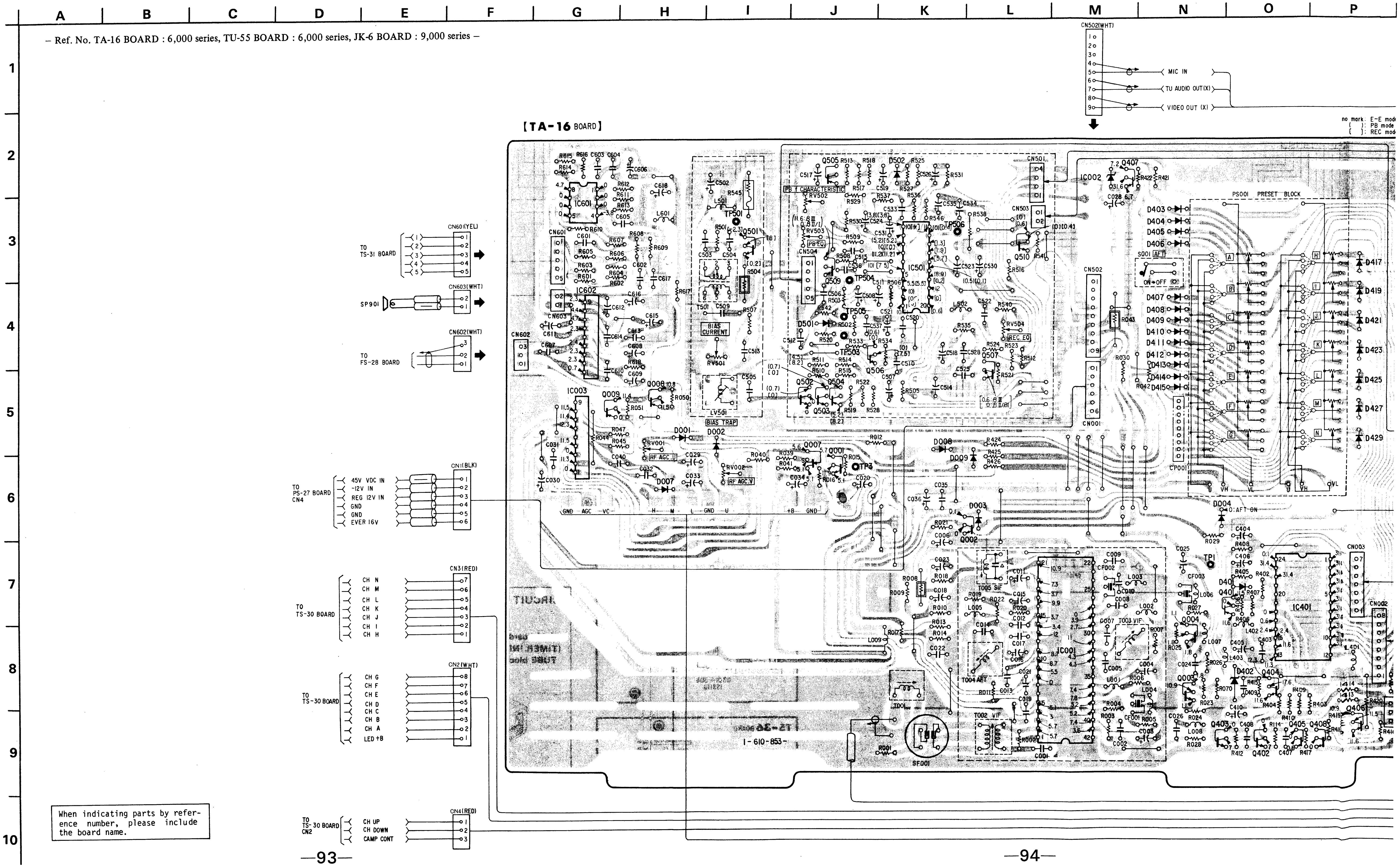

A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
9
10
TB991
UHF
INPUT
OUTPUT
UHF SPLITER
UHF OUT
S996
VHF ANTENNA CHANGE SW
VHF
INPUT
OUTPUT
VHF SPLITER
TV
VTR: RF SIGNAL IS INPUT FROM MODULATOR
VIDEO
TO YC-27 BOARD RF MODULATOR
RF
TO PS-27 BOARD CN4
WHT
TO TS-30 BOARD CN2
TS-30 BOARD(1/2)
CP102
CP101
D101-114
SG213T3
CHANNEL INDICATOR
D118
D101 A
D102 B
D103 C
D104 D
D105 E
D106 F
D107 G
D115
D116
D117
D119
D115-119
ISS119
D108 H
D109 I
D110 J
D111 K
D112 L
D113 M
D114 N
J
8 CH G GRY
7 CH F VIO
6 CH E BLU
5 CH D PNK
4 CH C YEL
3 CH B ORG
2 CH A RED
1 LED (+) BRN
I
7 CH N VIO
6 CH M BLU
5 CH L PNK
4 CH K YEL
3 CH J ORG
2 CH I RED
1 CH H BRN
VIO
BLU
PNK
YEL
ORG
RED
BRN
GRY


H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
TB991
UHF SPLITER
INPUT
OUTPUT
UHF OUT
UHF
S996
VHF ANTENNA CHANGE SW
VHF SPLITER
VHF
TV
VTR: RF SIGNAL IS INPUT FROM MODULATOR
VIDEO
TO YC-27 BOARD RF MODULATOR
RF
UHF/VHF TUNER BT-866
UHF IN
VHF IN
IF OUT
AGC
VC
+B
TU-55 BOARD
TA-16 BOARD
no mark : E-E mode
( ) : PB mode
[ ] : REC mode
IF IN
IC003 LA7920
Q008 2SA1048 BAND VL SW
Q009 2SA1048 BAND VH SW
D007 ISS119
Q007 2SK43-3 AFT
D008,009 ISS119
SF001 58.75MHz
T001 VIF
T002 VIF
T003 VIF
T004 AFT
T005 SIF
CF001 4.5MHz TRAP
CF002 4.5MHz
CF003 4.5MHz TRAP
Q003 2SC2785 PHASE COMP
Q004 2SA1048 BUFFER
IC001 CX885B VIF/SIF
VIDEO AMP
IF AGC
ANC
VIDEO DET
SIF AMP
SIF LIMITTER
LIMITTER
VIF AMP
RF AGC
AFT AMP
AFT DET
VOLUME CONTROL
FM DET
RV001
RF AGC U
RF AGC V
D001 ISS119
TP3
Q001 2SC2785 AFT
D002 ISS119
Q002 2SC2785 AF MUTE
D003,004 ISS119
O:AFT ON
S001 AFT SW ON → OFF
CN001 (BLK)
45V VDC IN
-12V IN
REG 12V IN
GND
EVER 16V
TO PS-27 BOARD CN4
CN004 (RED)
CH UP
CH DOWN
CAMP CONT
TO TS-30 BOARD CN2
IC401 μPC1363C BAND SELECTER AFT
D401 ISS119
CN003 (RED)
CN002 (WHT)
LED (+)
PS001 PRESET BLOCK
CP001
D101-114 SG213T3 CHANNEL INDICATOR
Q402 2SC2785 SW
Q403 2SC2785 SW
Q401 2SA1048 DEFEET
Q404 2SC2785 12V REG
Q406 2SA1048 LED B+ REG
Q408 2SC2785 SW
Q405 2SC2785 SW
Q407 2SC2785 33V REG
D402 RD13E-B1 12V REG
IC002 μPC574J 33V REG
R043 2.2k(1/2W)
IC501 LA7046 REC/PB
MIC AMP
ALC
LOGIC CONTROL
MUTING CONTROL
REC AMP
ALC DETECTOR
EQ AMP
PB f CHARACTERISTIC
LINE AMP
TP503
TP505
TP504
TP506
TP501
Q507 2SC2785 βⅢ REC EQ
Q510 2SC2785 AGC
Q509 2SC2785 HIGH FREQENCY COMPENSATION
Q505 2SA1048 PB EQ SW
D502 ISS119
BIAS OSC
BIAS CURRENT
BIAS TRAP
Q501 2SD774 REC/FE BIAS OSC
Q502,Q503 2SC945 REC BIAS CUT
Q504 2SA1048 PB SW
IC601 μPC4558C AUDIO CONTROL


O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
B1
C1
D1
1
2
3
4
5
6
7
8
9
10
no mark : E-E mode
( ) : PB mode
[ ] : REC mode
Q003 2SC2785 PHASE COMP
Q004 2SA1048 BUFFER
IC001 CX885B VIF/SIF
VIDEO AMP
IF AGC
ANC
VIDEO DET
SIF AMP
SIF LIMITTER
LIMITTER
FM DET
VIF AMP
RF AGC
AFT AMP
AFT DET
VOLUME CONTROL
T001 VIF
T002 VIF
T003 VIF
T004 AFT
T005 SIF
SF001 58.75 MHz
CF001 4.5MHz TRAP
CF002 4.5MHz
CF003 4.5MHz TRAP
Q007 2SK43-3 AFT
RV001
RF AGC U
RF AGC V
TP3
D001 ISS119
D002 ISS119
Q001 2SC2785 AFT
Q002 2SC2785 AF MUTE
D003,004 ISS119
0: AFT ON
S001 AFT SW ON → OFF
D401 ISS119
IC401 μPC1363C BAND SELECTER AFT
Q401 2SA1048 DEFEET
Q407 2SC2785 33V REG
IC002 μPC574J 33V REG
PS001 PRESET BLOCK
CP001
Q507 2SC2785 ßIII REC EQ
Q510 2SC2785 AGC
PB 12V
AUDIO MUTE
ßIII
IC501 LA7046 REC/PB
ALC
LOGIC CONTROL
MUTING CONTROL
REC AMP
ALC DETECTOR
MIC AMP
EQ AMP
LINE AMP
PB f CHARACTERISTIC
PB EQ
REC EQ
TP503
TP504
TP505
TP506
TP501
LV501
BIAS TRAP
Q509 2SC2785 HIGH FREQUENCY COMPENSATION
Q505 2SA1048 PB EQ SW
D502 ISS119
BIAS OSC
T501
BIAS CURRENT
Q501 2SD774 REC/FE BIAS OSC
Q502,Q503 2SC945 REC BIAS CUT
Q504 2SA1048 PB SW
Q506 2SC2785 PB SW
D501 ISS119
IC602 LA4140 OUTPUT AMP
IC601 μPC4558C AUDIO CONTROL
27Vp-p
270Vp-p
14Vp-p
50Vp-p
120Vp-p
45Vp-p
JK-6(1/2) BOARD
TO YC-27 BOARD CN4
CN502 (WHT)
VIDEO OUT (X)
TU AUDIO OUT (Y)
TU AUDIO OUT (X)
GND
MIC IN (X)
MIC IN (Y)
CNJ003 VIDEO IN
CNJ001 AUDIO IN
CNJ002 MIC
CN501 (BLK)
PB 12V IN
REC P 12V
AUDIO MUTE
ßIII SIG
TO SS-13 BOARD CN412
CN503 (BLK)
AUDIO OUT (X)
AUDIO OUT (Y)
TO YC-27 BOARD CN6
CN504 (WHT)
AUDIO HEAD (G)
AUDIO HEAD (Y)
AUDIO HEAD (X)
ERASE HEAD (X)
ERASE HEAD (Y)
AUDIO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
CN602 (WHT)
AUDIO LEVEL VR
GND
TO FS-28 BOARD
CN603 (WHT)
SPEAKER (+)
SPEAKER (−)
SP901
CN601 (YEL)
SP1
SP2
5V
-4V
TO TS-31 BOARD

TA-16 (VIF, SIF, AFT, AGC), TU-55 (TUNER), JK-6 (JACK) PRINTED WIRING BOARDS

– Ref. No. TA-16 BOARD : 6,000 series, TU-55 BOARD : 6,000 series, JK-6 BOARD : 9,000 series –


A
B
C
D
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H
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J
K
L
M
N
O
P
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2
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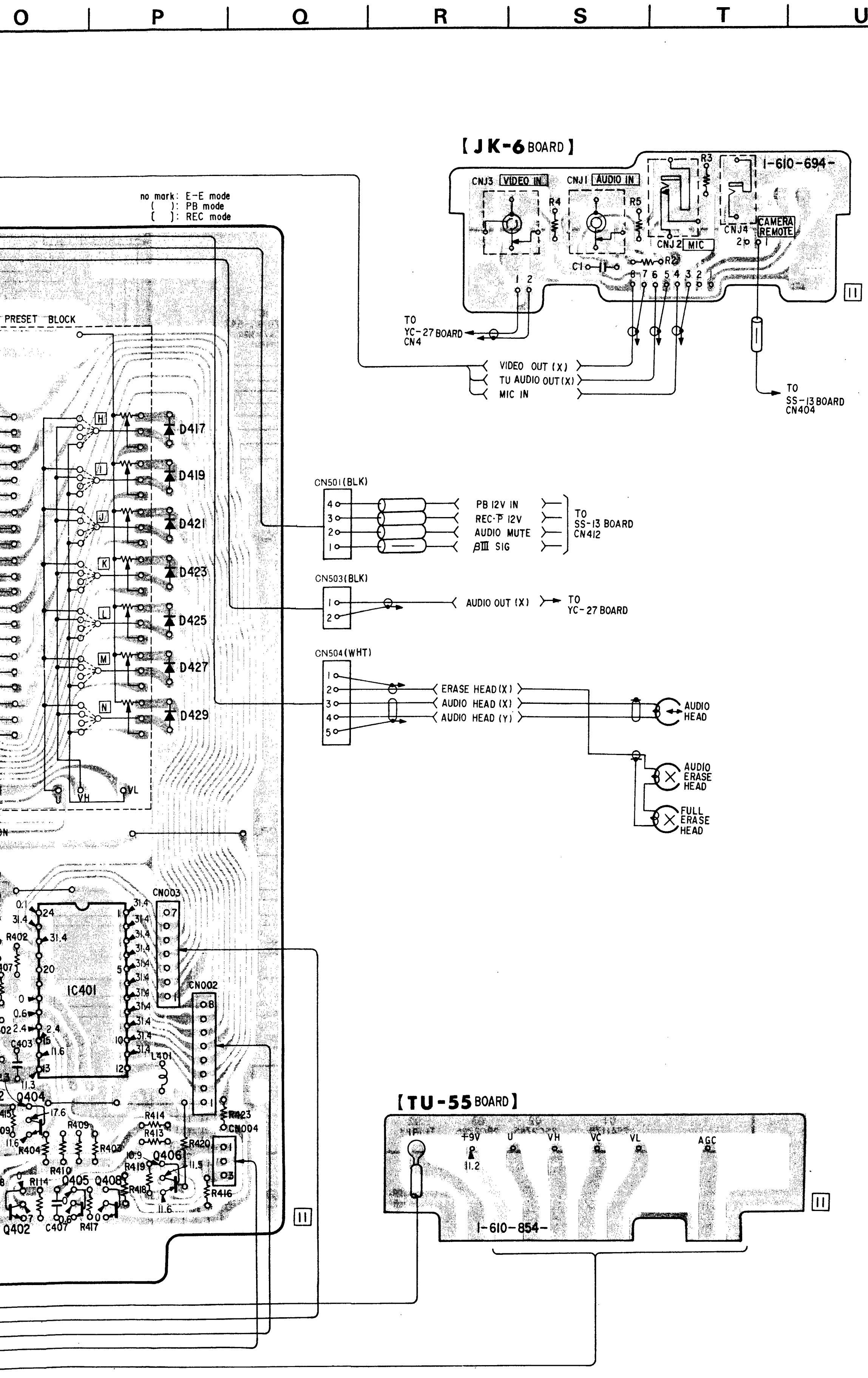
4
5
6
7
8
9
10
CN502(WHT)
MIC IN
TU AUDIO OUT(X)
VIDEO OUT (X)
no mark: E-E mod
( ): PB mode
[ ]: REC mod
[TA-16 BOARD]
CN601(YEL)
TO TS-31 BOARD
CN603(WHT)
SP901
CN602(WHT)
TO FS-28 BOARD
CN1(BLK)
TO PS-27 BOARD CN4
45V VDC IN
-12V IN
REG 12V IN
GND
GND
EVER 16V
CN3(RED)
TO TS-30 BOARD
CH N
CH M
CH L
CH K
CH J
CH I
CH H
CN2(WHT)
TO TS-30 BOARD
CH G
CH F
CH E
CH D
CH C
CH B
CH A
LED +B
CN4(RED)
TO TS-30 BOARD CN2
CH UP
CH DOWN
CAMP CONT
IC601
IC602
IC003
IC501
IC002
IC001
IC401
PS001 PRESET BLOCK
S001 AFT
ON OFF
PB F CHARACTERISTIC
PB EQ
BIAS CURRENT
BIAS TRAP
REC EQ
RF AGC U
RF AGC V
GND AGC VC H M L GND U +B GND
D004 0: AFT ON
T005 SIF
T003 VIF
T004 AFT
T002 VIF
T001
SF001
TP1
TP3
TP501
TP504
TP505
TP506
1-610-853-

When indicating parts by reference number, please include the board name.


O
P
Q
R
S
T
U
V
W
X
Y
1
2
3
4
5
6
7
8
9
10
【JK-6 BOARD】
1-610-694-
CNJ3 VIDEO IN
CNJ1 AUDIO IN
CNJ2 MIC
CNJ4 CAMERA REMOTE
R3
R4
R5
C1
R2
TO YC-27 BOARD CN4
VIDEO OUT (X)
TU AUDIO OUT (X)
MIC IN
TO SS-13 BOARD CN404
no mark: E-E mode
( ): PB mode
[ ]: REC mode
PRESET BLOCK
D417
D419
D421
D423
D425
D427
D429
CN501 (BLK)
PB 12V IN
REC·P 12V
AUDIO MUTE
βIII SIG
TO SS-13 BOARD CN412
CN503 (BLK)
AUDIO OUT (X)
TO YC-27 BOARD
CN504 (WHT)
ERASE HEAD (X)
AUDIO HEAD (X)
AUDIO HEAD (Y)
AUDIO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
VH
VL
CN003
CN002
CN004
IC401
L401
R402
C403
Q404
Q405
Q406
Q402
R404
R409
R410
R413
R414
R416
R417
R418
R419
R420
R423
C407
【TU-55 BOARD】
+9V
U
VH
VL
AGC
1-610-854-
II

IC, Q	D	TP, ADJ
505 407 IC2	502	
IC601 501 510 509 IC501	403 404 405 406 417	RV502 501 506 RV503
	407 408 419 409 421 410 411 501 412 423 413 414 425	504 505 RV504 503 RV501
IC602 506 507 502,503,504 008 009 IC003	415 427 429 1 2	LV501 RV1 3
7 1 2	8 9 7 3 4	RV2
401 IC401	401	
4 IC1 404 3	402	
406 402,405 403 408		
IC, Q	D	TP, ADJ

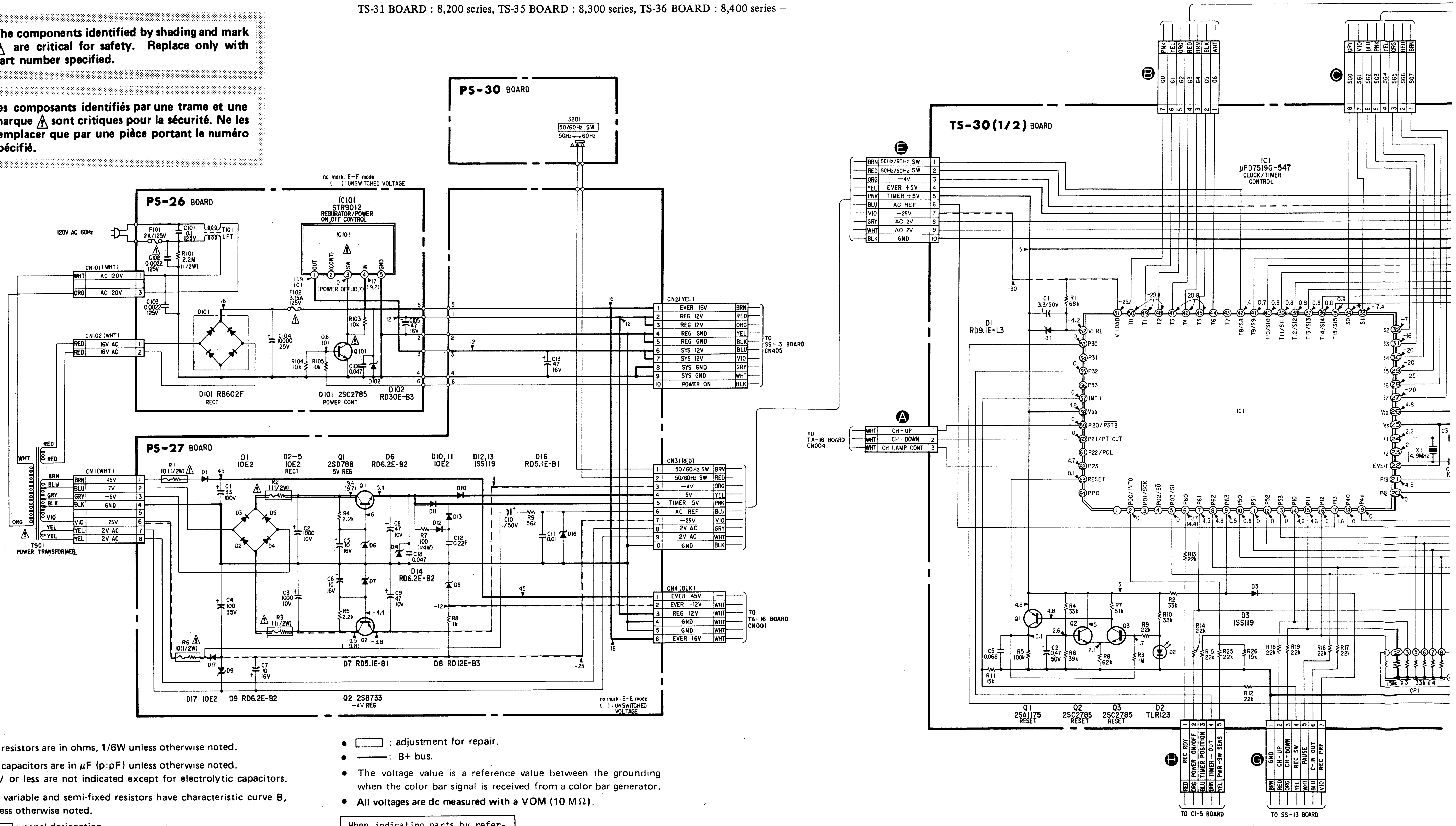
POWER SUPPLY, TIMER POWER SUPPLY, TIMER

PS-26 (POWER SUPPLY), PS-27 (POWER SUPPLY), PS-30 (50Hz/60Hz SELECT SWITCH), TS-30 (TIMER, CHANNEL SWITCH), TS-31 (TIMER, VOICE SYNTHESIS), TS-35 (TIMER SWITCH), TS-36 (CONFIRMATION) SCHEMATIC DIAGRAM

– Ref. No. PS-26 BOARD : 7,100 series, PS-27 BOARD : 7,000 series, PS-30 BOARD : 7,200 series, TS-30 BOARD : 8,000 series, TS-31 BOARD : 8,200 series, TS-35 BOARD : 8,300 series, TS-36 BOARD : 8,400 series –

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

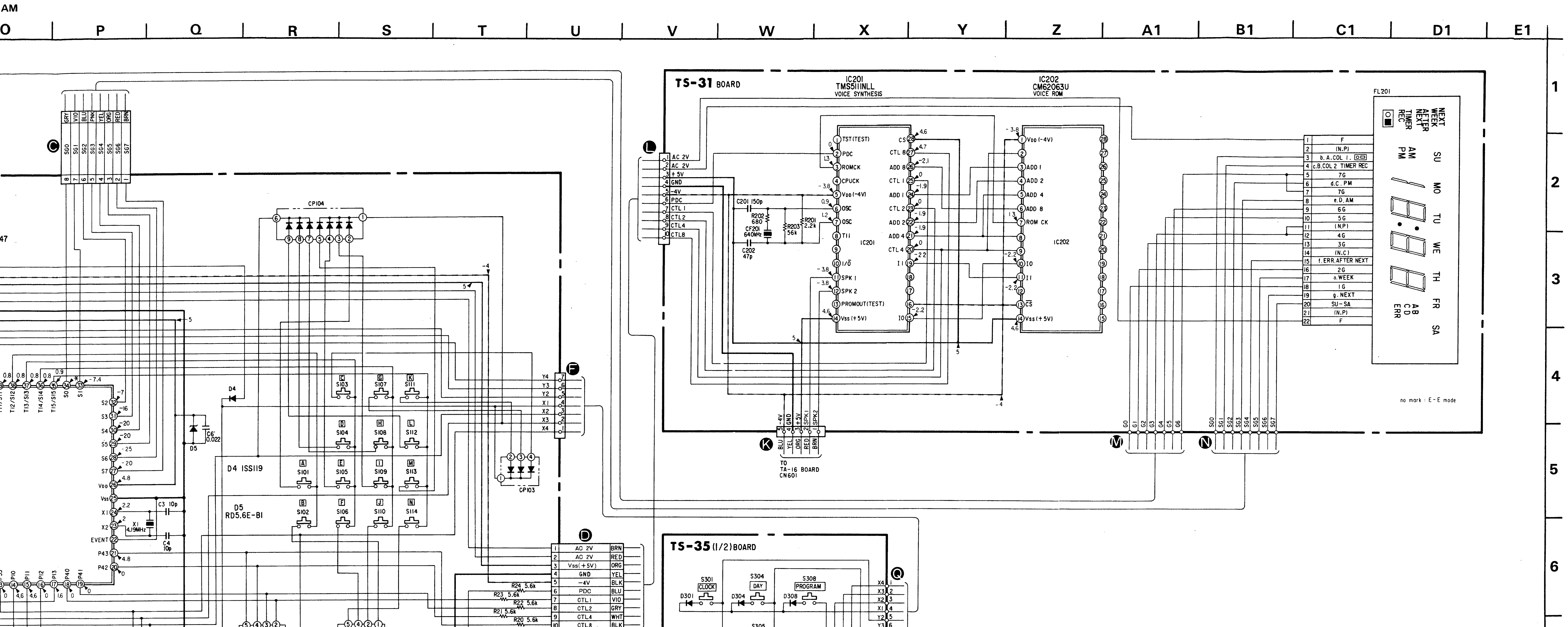
Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

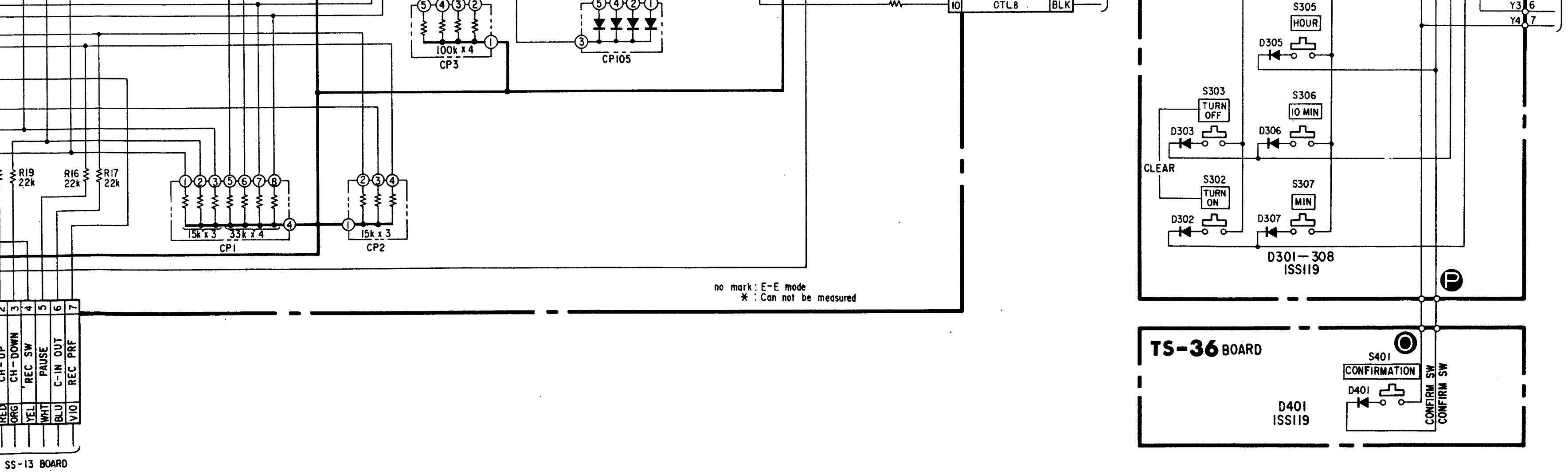

A B C D E F G H I J K L M N O P
1 2 3 4 5 6 7 8 9 10
PS-30 BOARD
S201 50/60Hz SW 50Hz ⟵ 60Hz
no mark: E-E mode
( ): UNSWITCHED VOLTAGE
PS-26 BOARD
IC101 STR9012 REGULATOR/POWER ON/OFF CONTROL
120V AC 60Hz
F101 2A/125V
C101 0.1 125V
T101 LFT
R101 2.2M (1/2W)
C102 0.0022 125V
CN101 (WHT)
AC 120V
C103 0.0022 125V
F102 3.15A 125V
CN102 (WHT)
16V AC
D101 RB602F RECT
Q101 2SC2785 POWER CONT
D102 RD30E-B3
C104 10000 25V
R103 10k
R104 10k
R105 10k
C105 47 16V
C13 47 16V
PS-27 BOARD
D1 10E2
D2-5 10E2 RECT
Q1 2SD788 5V REG
D6 RD6.2E-B2
D10, 11 10E2
D12, 13 1SS119
D16 RD5.1E-B1
CN1 (WHT)
45V 7V −6V GND −25V 2V AC 2V AC
T901 POWER TRANSFORMER
D7 RD5.1E-B1
D8 RD12E-B3
D17 10E2
D9 RD6.2E-B2
Q2 2SB733 −4V REG
D14 RD6.2E-B2
CN2 (YEL)
EVER 16V, REG 12V, REG 12V, REG GND, REG GND, SYS 12V, SYS 12V, SYS GND, SYS GND, POWER ON
TO SS-13 BOARD CN405
CN3 (RED)
50/60Hz SW, 50/60Hz SW, −4V, 5V, TIMER 5V, AC REF, −25V, 2V AC, 2V AC, GND
CN4 (BLK)
EVER 45V, EVER −12V, REG 12V, GND, GND, EVER 16V
TO TA-16 BOARD CN001
TS-30 (1/2) BOARD
IC1 μPD7519G-547 CLOCK/TIMER CONTROL
50Hz/60Hz SW, 50Hz/60Hz SW, −4V, EVER +5V, TIMER +5V, AC REF, −25V, AC 2V, AC 2V, GND
CH-UP, CH-DOWN, CH LAMP CONT
TO TA-16 BOARD CN004
D1 RD9.1E-L3
X1 4.19MHz
Q1 2SA1175 RESET
Q2 2SC2785 RESET
Q3 2SC2785 RESET
D2 TLR123
D3 1SS119
REC RDY, POWER ON/OFF, TIMER POSITION, TIMER-OUT, PWR-SW SENS
TO CI-5 BOARD
GND, CH-UP, CH-DOWN, REC SW, PAUSE, C-IN OUT, REC PRF
TO SS-13 BOARD
SG0 SG1 SG2 SG3 SG4 SG5 SG6 SG7
G0 G1 G2 G3 G4 G5 G6

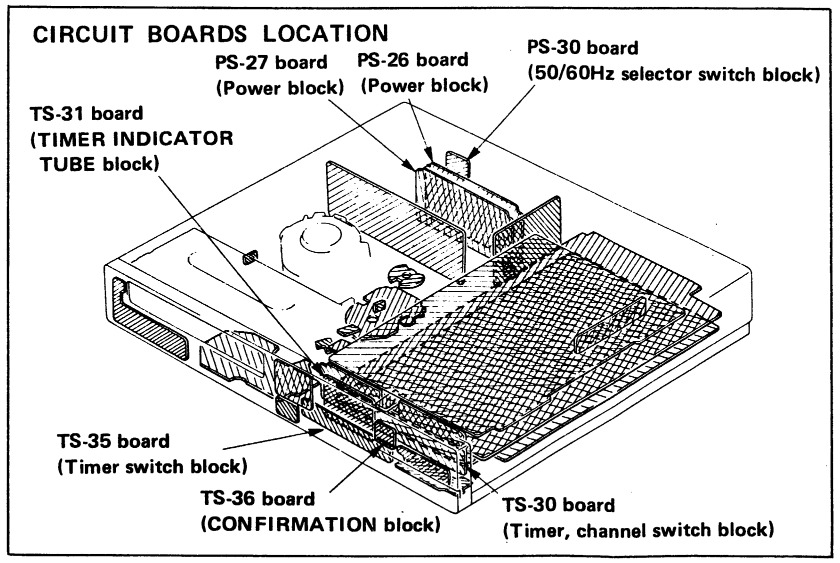
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- : Nonflammable resistor
- : Fusible resistor

- ▭ : adjustment for repair.
- ——: B+ bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
- **All voltages are dc measured with a VOM (10 MΩ).**

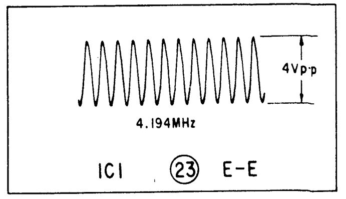
When indicating parts by reference number, please include the board name.


AM
O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
B1
C1
D1
E1
1
2
3
4
5
6
TS-31 BOARD
IC201
TMS5111NLL
VOICE SYNTHESIS
IC202
CM62063U
VOICE ROM
FL201
NEXT WEEK AFTER NEXT TIMER REC
AM PM
SU MO TU WE TH FR SA
AB CD ERR
C201 150p
R202 680
CF201 640kHz
C202 47p
R203 56k
R201 2.2k
TST(TEST)
PDC
ROMCK
CPUCK
Vdd (-4V)
OSC
T11
I/O
SPK 1
SPK 2
PROMOUT(TEST)
Vss (+5V)
CS
CTL 8
ADD 8
CTL 1
ADD 1
CTL 2
ADD 2
ADD 4
CTL 4
ADD 1
ADD 2
ADD 4
ADD 8
ROM CK
CS
Vss (+5V)
AC 2V
+5V
GND
-4V
CTL 1
CTL 2
CTL 4
CTL 8
F
(N.P)
b.A.COL 1.
c.B.COL 2 TIMER REC
7G
d.C.PM
e.D.AM
6G
5G
4G
3G
(N.C)
f.ERR.AFTER NEXT
2G
a.WEEK
1G
g.NEXT
SU-SA
-4V GND +5V SPK1 SPK2
BLU YEL ORG RED BRN
TO TA-16 BOARD CN601
G0 G1 G2 G3 G4 G5 G6
SG0 SG1 SG2 SG3 SG4 SG5 SG6 SG7
no mark : E-E mode
GRY VIO BLU PNK YEL ORG RED BRN
SG0 SG1 SG2 SG3 SG4 SG5 SG6 SG7
CP104
S103 S107 S111
S104 S108 S112
S101 S105 S109 S113
S102 S106 S110 S114
D4 ISS119
D5 RD5.6E-B1
C6 0.022
CP103
Y4 Y3 Y2 X1 X2 X3 X4
S2 S3 S4 S5 S6 S7
Vdd Vss X1 X2 EVENT P43 P42
C3 10p
X1 4.19MHz
C4 10p
P10 P11 P12 P13 P40 P41
AC 2V
Vss(+5V)
GND
-4V
PDC
CTL1
CTL2
CTL4
CTL8
BRN RED ORG YEL BLK BLU VIO GRY WHT BLK
R24 5.6k
R23 5.6k
R22 5.6k
R21 5.6k
R20 5.6k
TS-35 (1/2) BOARD
S301 CLOCK
S304 DAY
S308 PROGRAM
D301 D304 D308
X4 X3 X2 X1 Y2 Y3 Y4

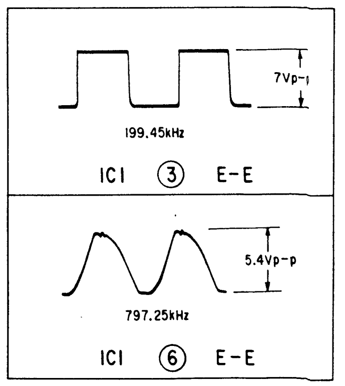

7
8
9
CP3 100k x 4
CP105
R19 22k
R16 22k
R17 22k
15k x 3 33k x 4
CP1
15k x 3
CP2
no mark : E-E mode
* : Can not be measured
CH-DOWN REC SW PAUSE C-IN OUT REC PRF
WHT YEL VIO
SS-13 BOARD
S305 HOUR
D305
S303 TURN OFF
D303
S306 10 MIN
D306
CLEAR
S302 TURN ON
D302
S307 MIN
D307
D301-308 ISS119
TS-36 BOARD
S401 CONFIRMATION
D401
D401 ISS119
CONFIRM SW


CIRCUIT BOARDS LOCATION
PS-27 board (Power block)
PS-26 board (Power block)
PS-30 board (50/60Hz selector switch block)
TS-31 board (TIMER INDICATOR TUBE block)
TS-35 board (Timer switch block)
TS-36 board (CONFIRMATION block)
TS-30 board (Timer, channel switch block)

TS-30 BOARD



TS-31 BOARD

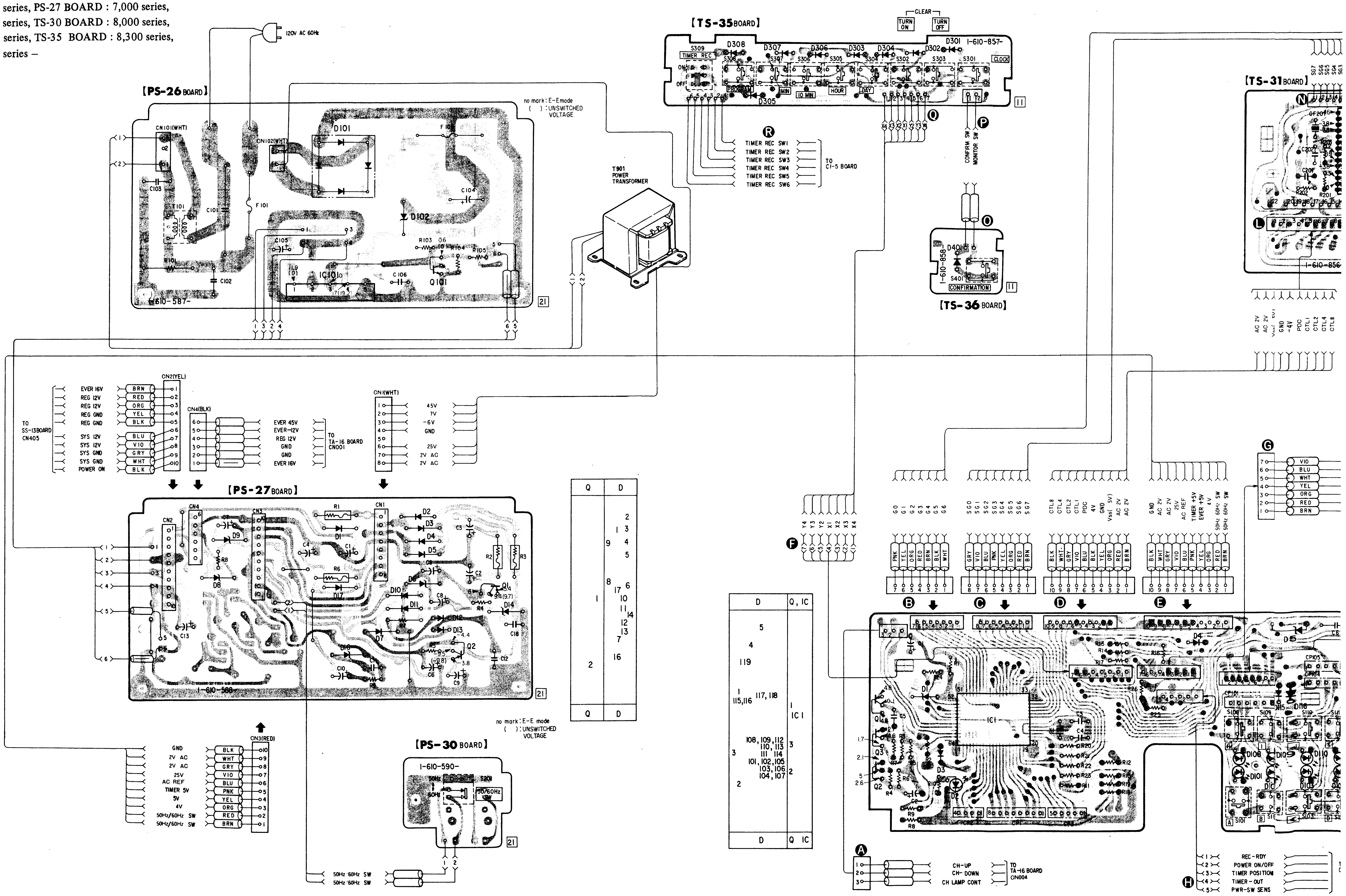


PS-26 (POWER SUPPLY), PS-27 (POWER SUPPLY), PS-30 (50Hz/60Hz SELECT SWITCH), TS-30 (TIMER, CHANNEL SWITCH), TS-31 (TIMER, VOICE SYNTHESIS), TS-35 (TIMER SWITCH), TS-36 (CONFIRMATION) PRINTED WIRING BOARDS

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P

1 2 3 4 5 6 7 8 9 10

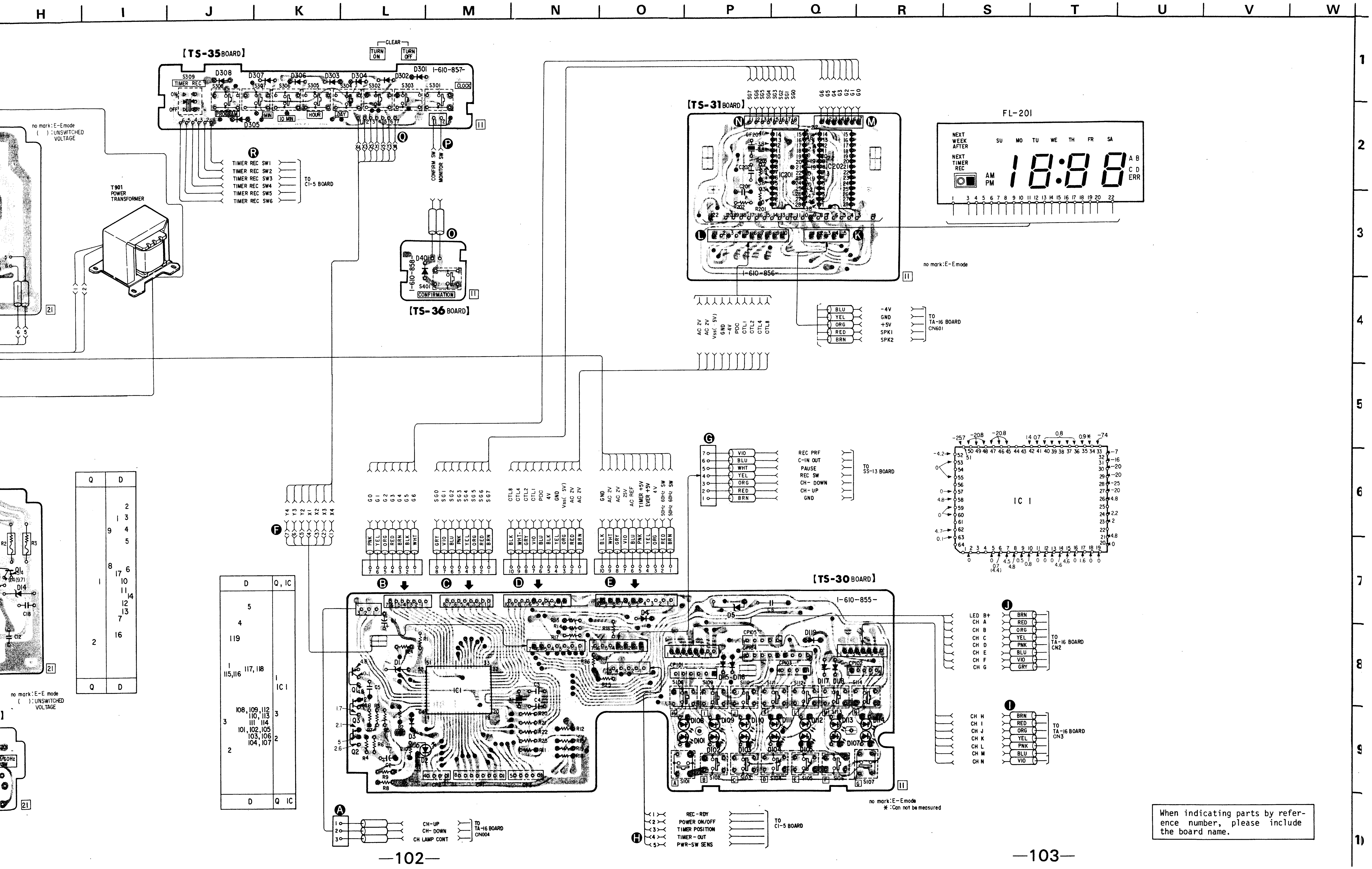
– Ref. No. PS-26 BOARD : 7,100 series, PS-27 BOARD : 7,000 series,
PS-30 BOARD : 7,200 series, TS-30 BOARD : 8,000 series,
TS-31 BOARD : 8,200 series, TS-35 BOARD : 8,300 series,
TS-36 BOARD : 8,400 series –


120V AC 60Hz
[PS-26 BOARD]
CN101(WHT)
CN102(WHT)
D101
F101
C101
C102
C103
C104
C105
C106
T101
R101
R103
R104
R105
D102
IC101
Q101
1-610-587-
21
no mark : E-E mode
( ) : UNSWITCHED VOLTAGE
T901 POWER TRANSFORMER
[TS-35 BOARD]
CLEAR
TURN ON
TURN OFF
S309 TIMER REC
D308 D307 D306 D303 D304 D302 D301
S308 S307 S306 S305 S304 S302 S303 S301
PROGRAM
MIN
10 MIN
HOUR
DAY
CLOCK
D305
1-610-857-
11
TIMER REC SW1
TIMER REC SW2
TIMER REC SW3
TIMER REC SW4
TIMER REC SW5
TIMER REC SW6
TO CI-5 BOARD
CONFIRM SW
MONITOR SW
D401
S401
CONFIRMATION
1-610-858-
[TS-36 BOARD]
[TS-31 BOARD]
1-610-856
AC 2V
AC 2V
GND
-4V
PDC
CTL1
CTL2
CTL4
CTL8
CN2(YEL)
EVER 16V BRN
REG 12V RED
REG 12V ORG
REG GND YEL
REG GND BLK
SYS 12V BLU
SYS 12V VIO
SYS GND GRY
SYS GND WHT
POWER ON BLK
TO SS-13BOARD CN405
CN4(BLK)
EVER 45V
EVER-12V
REG 12V
GND
GND
EVER 16V
TO TA-16 BOARD CN001
CN1(WHT)
45V
7V
-6V
GND
25V
2V AC
2V AC
[PS-27 BOARD]
CN2 CN4 CN3 CN1
1-610-588-
21
CN3(RED)
GND BLK
2V AC WHT
2V AC GRY
25V VIO
AC REF BLU
TIMER 5V PNK
5V YEL
4V ORG
50Hz/60Hz SW RED
50Hz/60Hz SW BRN
no mark : E-E mode
( ) : UNSWITCHED VOLTAGE
[PS-30 BOARD]
1-610-590-
S201
50Hz
60Hz
50/60Hz SW
50Hz 60Hz SW
50Hz 60Hz SW
Y4 Y3 Y2 Y1 X1 X2 X3 X4
G0 G1 G2 G3 G4 G5 G6
SG0 SG1 SG2 SG3 SG4 SG5 SG6 SG7
CTL8 CTL4 CTL2 CTL1 PDC 4V GND Vref(5V) AC 2V AC 2V
GND AC 2V AC 2V 25V AC REF TIMER +5V EVER +5V 4V 50Hz 60Hz SW 50Hz 60Hz SW
VIO BLU WHT YEL ORG RED BRN
IC1
CH-UP
CH-DOWN
CH LAMP CONT
TO TA-16 BOARD CN004
REC-RDY
POWER ON/OFF
TIMER POSITION
TIMER-OUT
PWR-SW SENS

Q	D
	2
	1 3
	9 4
	5
	8 6
	17
1	10
	11 14
	12
	13
	7
	16
2	
Q	D

D	Q, IC
5	
4	
119	
1 115,116 117,118	1 IC 1
108,109,112 3 110,113 111 114	3
101,102,105 103,106 104,107	2
2	
D	Q IC

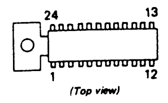
EL SWITCH), TS-31 (TIMER, VOICE SYNTHESIS), TS-35 (TIMER SWITCH), TS-36 (CONFIRMATION) PRINTED WIRING BOARDS


H I J K L M N O P Q R S T U V W
1 2 3 4 5 6 7 8 9 10
[TS-35 BOARD]
1-610-857-
CLEAR
TURN ON
TURN OFF
TIMER REC
PROGRAM
MIN
10 MIN
HOUR
DAY
CLOCK
TIMER REC SW1
TIMER REC SW2
TIMER REC SW3
TIMER REC SW4
TIMER REC SW5
TIMER REC SW6
TO CI-5 BOARD
CONFIRM SW
MONITOR SW
T901 POWER TRANSFORMER
no mark : E-E mode
( ) : UNSWITCHED VOLTAGE
[TS-36 BOARD]
1-610-858
CONFIRMATION
[TS-31 BOARD]
1-610-856
IC201
IC202
FL-201
NEXT WEEK AFTER
NEXT TIMER REC
SU MO TU WE TH FR SA
AM PM
18:88
A B C D ERR
no mark : E-E mode
-4V
GND
+5V
SPK1
SPK2
TO TA-16 BOARD CN601
AC 2V
AC 2V
Vss(5V)
GND
-4V
PDC
CTL1
CTL2
CTL4
CTL8
IC 1
REC PRF
C-IN OUT
PAUSE
REC SW
CH- DOWN
CH- UP
GND
TO SS-13 BOARD
[TS-30 BOARD]
1-610-855-
IC1
LED B+
CH A
CH B
CH C
CH D
CH E
CH F
CH G
TO TA-16 BOARD CN2
CH H
CH I
CH J
CH K
CH L
CH M
CH N
TO TA-16 BOARD CN3
no mark : E-E mode
* : Can not be measured
CH-UP
CH-DOWN
CH LAMP CONT
TO TA-16 BOARD CN004
REC-RDY
POWER ON/OFF
TIMER POSITION
TIMER-OUT
PWR-SW SENS
TO CI-5 BOARD
TIMER +5V
EVER +5V
AC REF
50Hz 60Hz SW
BLK WHT GRY VIO BLU PNK YEL ORG RED BRN

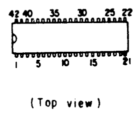
When indicating parts by reference number, please include the board name.

4-3. SEMICONDUCTORS

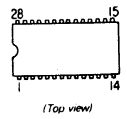
CX134A
CX135
CX187
CX188
CX196
CX822


24
13
1
12
(Top view)

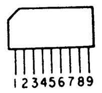
CX194B-0
CX194B-1
CX194B-5
CX885B
µPD553C-276
µPD553C-287


42 40 35 30 25 22
1 5 10 15 21
(Top view)

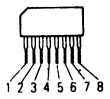
CX862


28
15
1
14
(Top view)

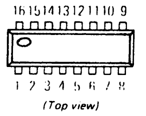
LA4140
LA7920



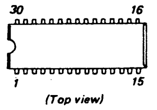
LA7046



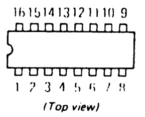
MB8791


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

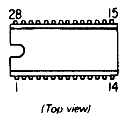
M32080SP


30
16
1
15
(Top view)

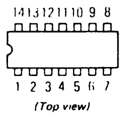
TC4053BP


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

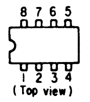
TMS5111NLL
CM62059U


28
15
1
14
(Top view)

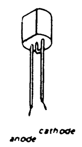
µPC324C


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

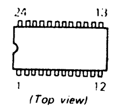
µPC358C
µPC4558C


8 7 6 5
1 2 3 4
(Top view)

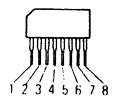
µPC574J


cathode
anode

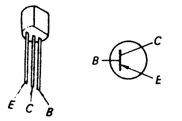
µPC1363C


24
13
1
12
(Top view)

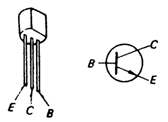
µPC1373H



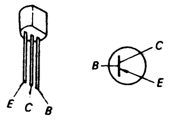
2SA733
2SA844
2SA925



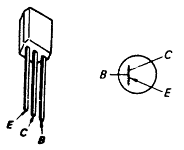
2SC945P
2SC1815



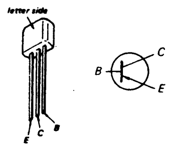
2SA772
2SB739
2SB740



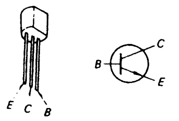
2SA1048-GR
2SA1115



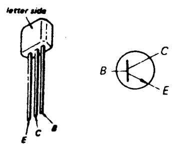
2SA1175


letter side
E C B
B
C
E

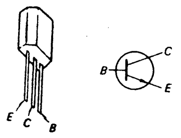
2SC1474
2SC1475
2SD788
2SD789



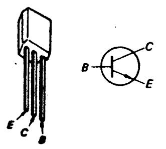
2SC2785


letter side
E C B
B
C
E

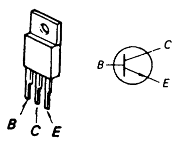
2SC403C



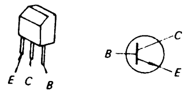
2SC403SP
2SC2458
2SC2603



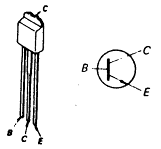
2SC1061
2SD313HP



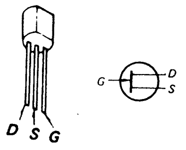
2SD773
2SD774



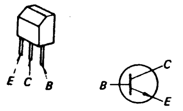
2SD1164



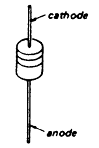
2SK43-3



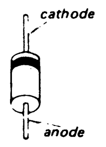
2SB733



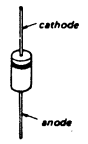
1SS119
1SS148


cathode
anode

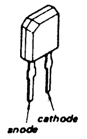
1SS133
RD10E-L2
RD10E-L3
RD12E-B3
RD13E-B1
RD13E-B2
RD13E-B3
RD30E-B1
RD30E-B2
RD30E-B3
RD5.1E-B1
RD5.1E-L1
RD5.6E-B1
RD5.6E-B2
RD5.6E-B3
RD6.2E-B2
RD6.2E-B3
RD7.5E-B1
RD8.2E-L2
RD9.1E-B3
RD9.1E-L3


cathode
anode

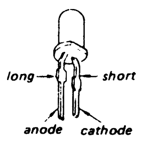
10E2


cathode
anode

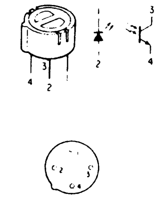
PH302B


cathode
anode

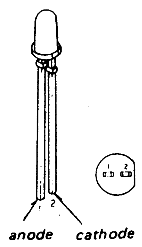
TLG123A
TLR123
TLY123


long
short
anode
cathode

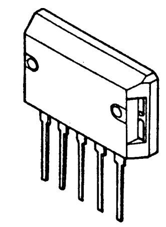
GP-2S02A
GP-2S02B
GP-2S02C



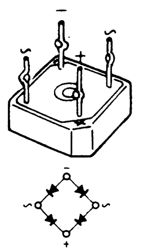
SG213T


anode
cathode

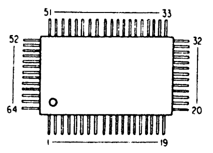
STR9012



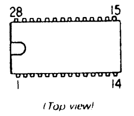
RB602F



µPD7519G-547

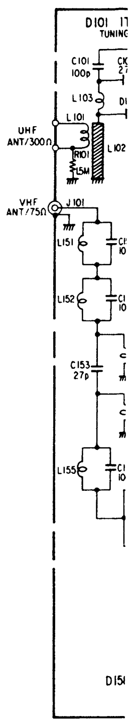

51
33
52
32
64
20
1
19

CM62063U

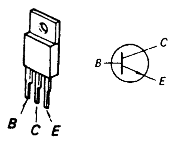

28
15
1
14
(Top view)

4-4. UHF

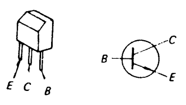
— B


D101
C101 100p
L103
L101
UHF ANT/300Ω
L102
VHF ANT/75Ω
L151
L152
C153 27p
L155

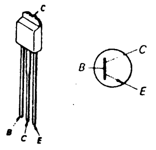
2SC1061
2SD313HP



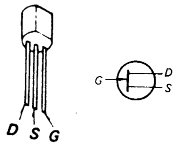
2SD773
2SD774



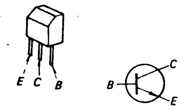
2SD1164



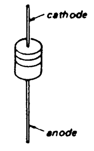
2SK43-3



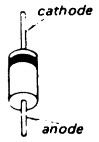
2SB733



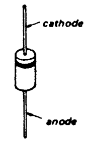
1SS119
1SS148


cathode
anode

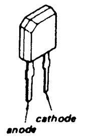
1SS133
RD10E-L2
RD10E-L3
RD12E-B3
RD13E-B1
RD13E-B2
RD13E-B3
RD30E-B1
RD30E-B2
RD30E-B3
RD5.1E-B1
RD5.1E-L1
RD5.6E-B1
RD5.6E-B2
RD5.6E-B3
RD6.2E-B2
RD6.2E-B3
RD7.5E-B1
RD8.2E-L2
RD9.1E-B3
RD9.1E-L3


cathode
anode

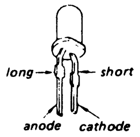
10E2


cathode
anode

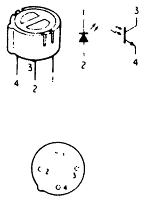
PH302B


cathode
anode

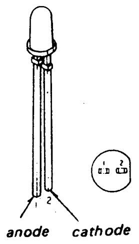
TLG123A
TLR123
TLY123


long
short
anode
cathode

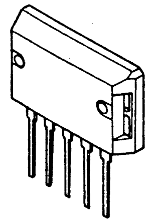
GP-2S02A
GP-2S02B
GP-2S02C



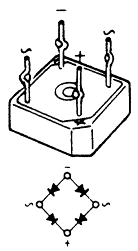
SG213T


anode
cathode

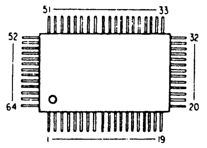
STR9012



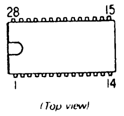
RB602F



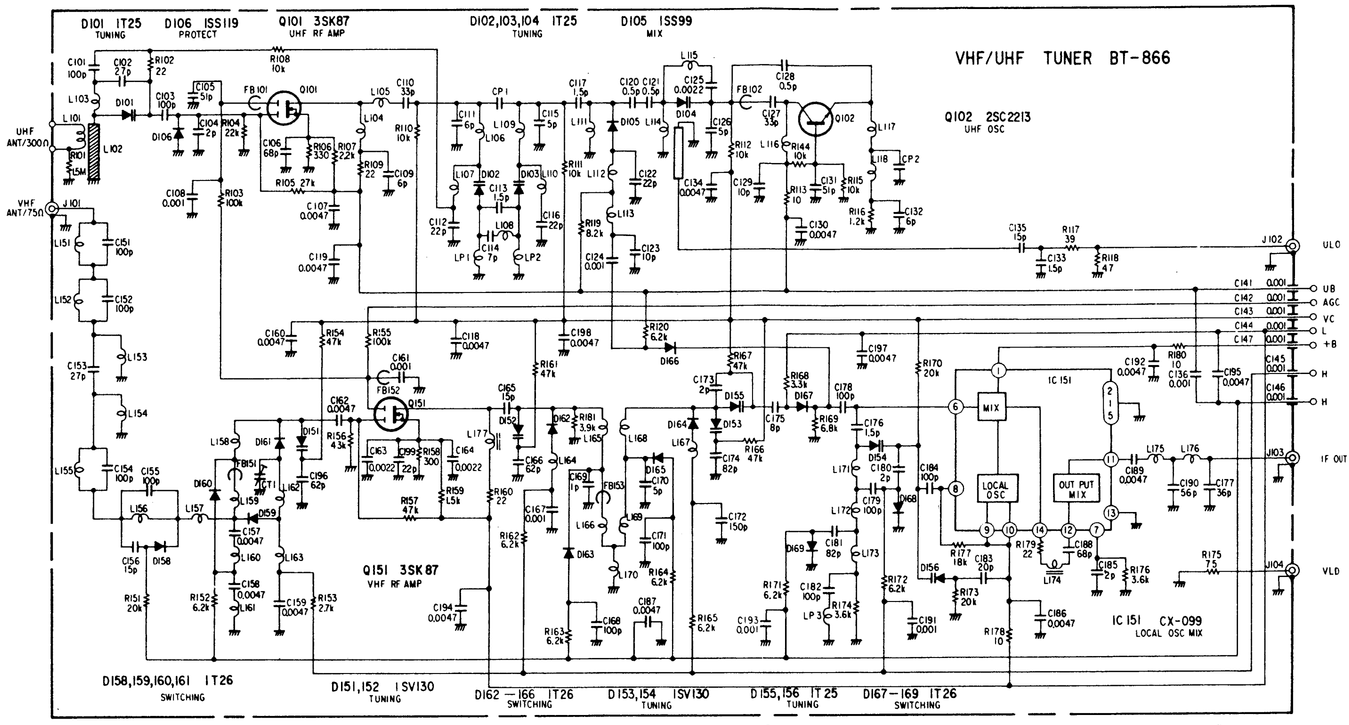
µPD7519G-547


51
33
52
32
64
20
1
19

CM62063U


28
15
1
14
(Top view)

4-4. UHF/VHF TUNER SCHEMATIC DIAGRAM
– BT-866 –


VHF/UHF TUNER BT-866
D101 1T25 TUNING
D106 1SS119 PROTECT
Q101 3SK87 UHF RF AMP
D102,103,104 1T25 TUNING
D105 1SS99 MIX
Q102 2SC2213 UHF OSC
UHF ANT/300Ω
VHF ANT/75Ω
J101
J102
J103
J104
ULO
UB
AGC
VC
L
+B
H
H
IF OUT
VLO
Q151 3SK87 VHF RF AMP
IC151
MIX
LOCAL OSC
OUT PUT MIX
IC151 CX-099 LOCAL OSC MIX
D158,159,160,161 1T26 SWITCHING
D151,152 1SV130 TUNING
D162 — 166 1T26 SWITCHING
D153,154 1SV130 TUNING
D155,156 1T25 TUNING
D167—169 1T26 SWITCHING

- Tuner reference numbers are not included in the Electrical Parts List.

SECTION 5
EXPLODED VIEWS

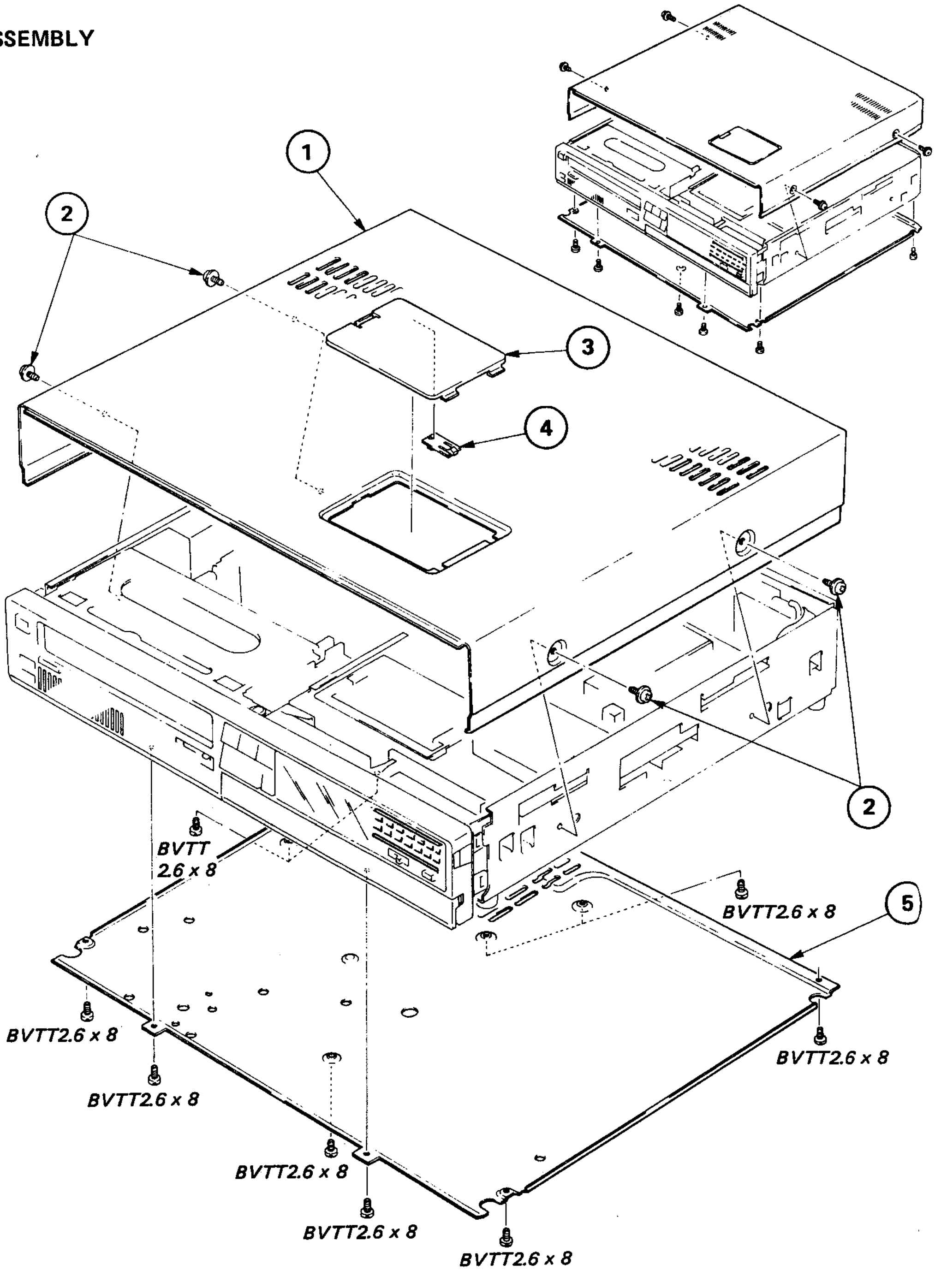
NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

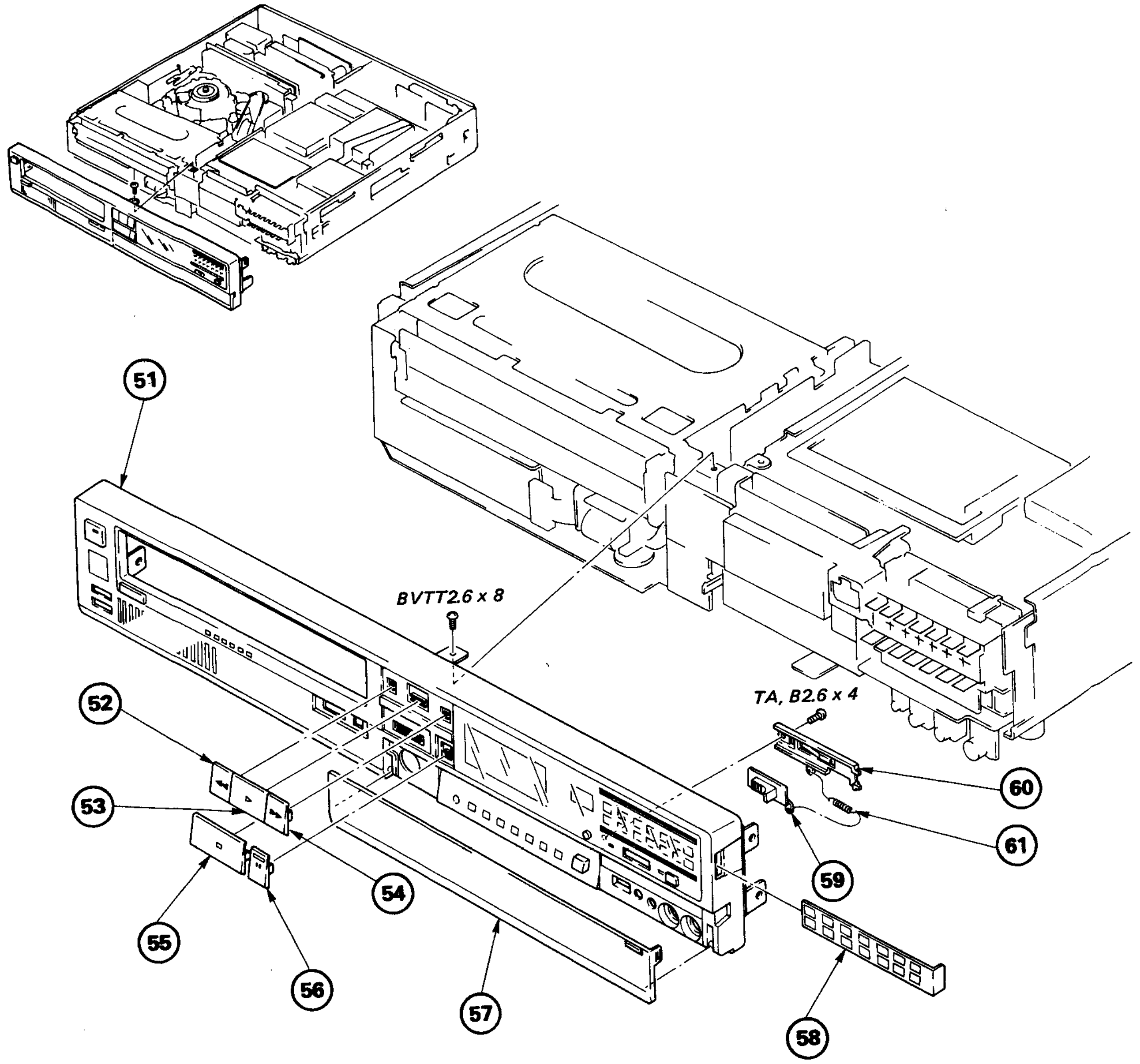
Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

5-1. CABINET ASSEMBLY



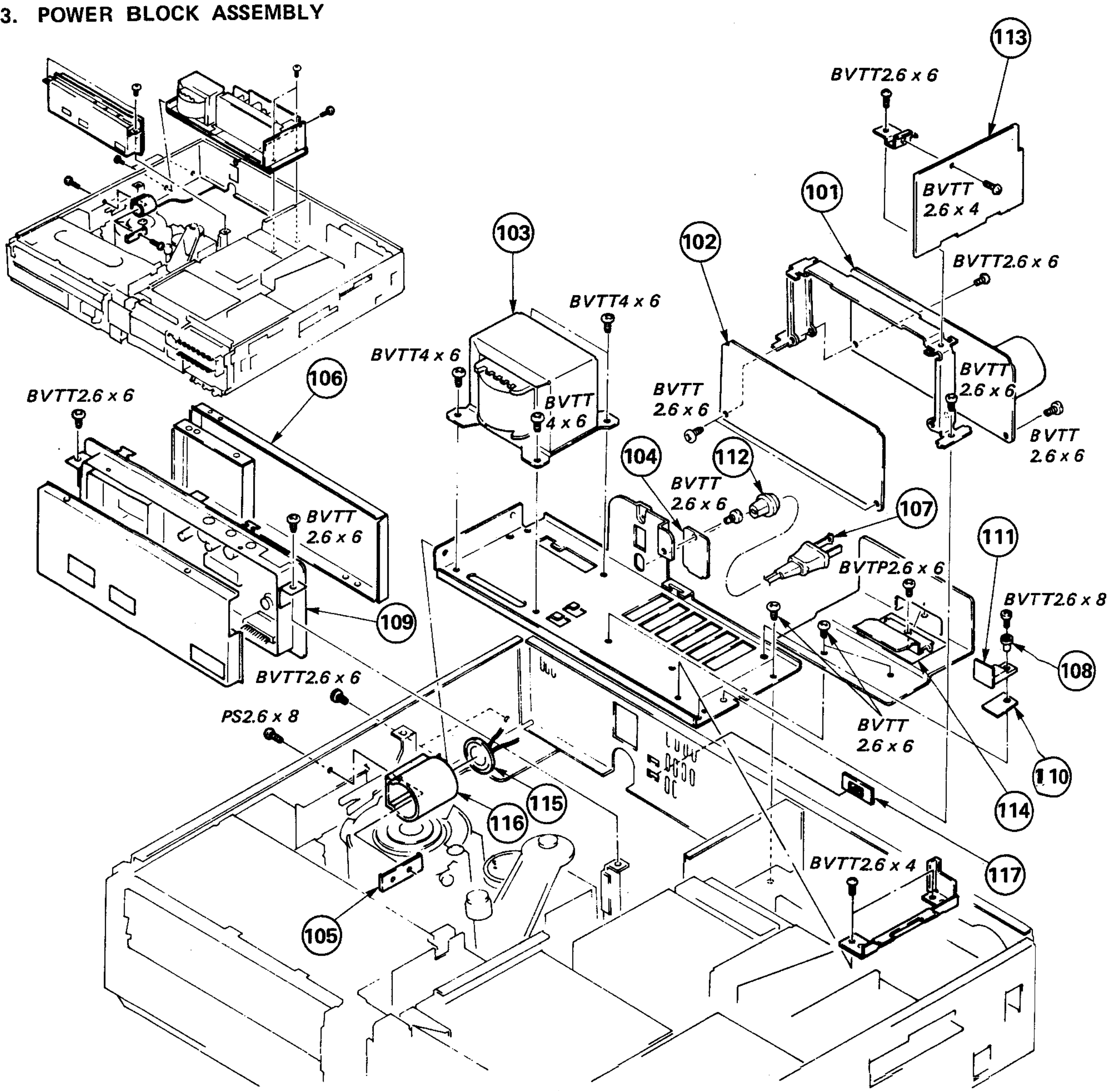
No.	Part No.	Description	Remark
1	X-3681-914-0	CASE ASSY (SL-2410 USA MODEL)	
	X-3679-133-4	CASE ASSY (SL-2410 CANADIAN MODEL)	
	X-3681-927-0	CASE ASSY (SL-2415 USA MODEL)	
2	4-847-802-11	SCREW, CASE STOPPER	
3	X-3681-917-0	LID ASSY, PRESET (SL-2410 USA MODEL)	
	X-3679-157-3	LID ASSY, PRESET (SL-2410 CANADIAN MODEL)	
	X-3681-925-0	LID ASSY, PRESET (SL-2415 USA MODEL)	
4	3-679-148-00	BUTTON, SELECTION, AFT	
5	X-3679-131-0	PLATE ASSY, BOTTON	

5-2. FRONT PANEL ASSEMBLY



No.	Part No.	Description	Remark
51	X-3681-916-0	PANEL ASSY, FRONT(SL-2410 USA MODEL)	
	X-3681-910-0	PANEL ASSY, FRONT(SL-2410 CANADIAN MODEL)	
	X-3681-918-0	PANEL ASSY, FRONT(SL-2415 USA MODEL)	
52	3-681-930-21	BUTTON	
53	X-3681-913-0	BUTTON ASSY, PLAY	
54	3-681-930-31	BUTTON	
55	3-681-931-11	BUTTON, STOP	
56	X-3681-912-0	BUTTON ASSY, PAUSE	
57	X-3681-915-0	DOOR ASSY, TIMER (SL-2410 USA MODEL)	
	X-3681-911-0	DOOR ASSY, TIMER (SL-2410 CANADIAN MODEL)	
	X-3681-919-0	DOOR ASSY, TIMER (SL-2415 USA MODEL)	
58	3-681-949-01	HOLDER, DIAL SCALE (SL-2410 USA MODEL)	
	3-681-949-02	HOLDER, DIAL SCALE (SL-2410 CANADIAN MODEL SL-2415 USA MODEL)	
59	3-681-926-00	BUTTON, RECORDING	
60	3-681-927-00	SPRING	
61	3-489-099-11	SPRING, TENSION	

5-3. POWER BLOCK ASSEMBLY



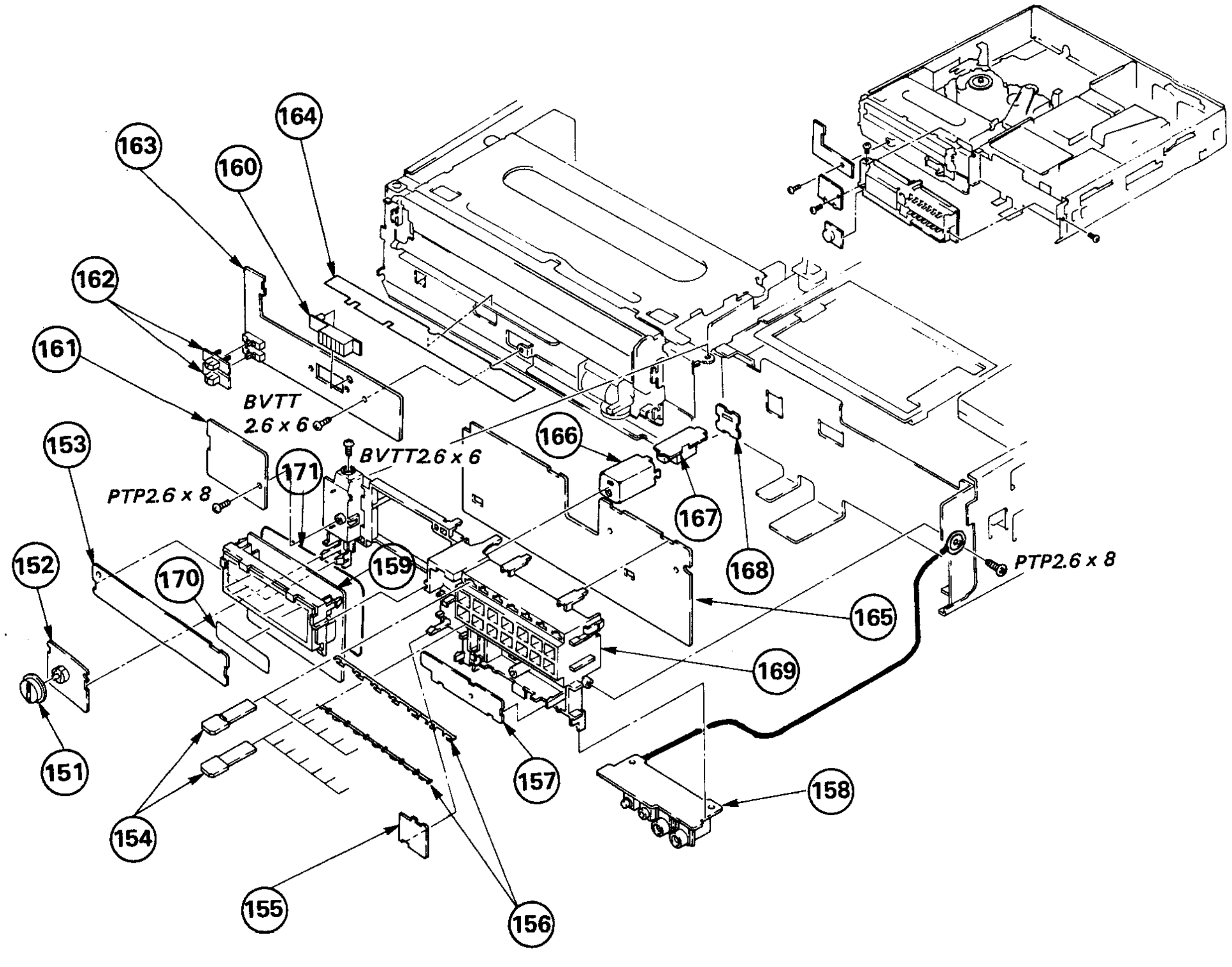
113
BVTT2.6 x 6
101
BVTT 2.6 x 4
103
102
BVTT2.6 x 6
BVTT4 x 6
BVTT4 x 6
BVTT 2.6 x 6
BVTT 4 x 6
BVTT 2.6 x 6
BVTT 2.6 x 6
106
BVTT2.6 x 6
104
112
BVTT 2.6 x 6
107
111
BVTT 2.6 x 6
BVTP2.6 x 6
BVTT2.6 x 8
109
108
BVTT2.6 x 6
PS2.6 x 8
BVTT 2.6 x 6
110
115
116
114
117
BVTT2.6 x 4
105

No.	Part No.	Description	Remark
101	♠:1-610-587-00	PS-26 BOARD	
102	♠:1-610-588-00	PS-27 BOARD	
103	⚠1-447-676-00	TRANSFORMER, POWER T901	
104	♠:1-610-590-00	PS-30 BOARD	
105	♠:3-681-908-00	BRACKET, SPEAKER	
106	♠:3-679-241-00	CASE (LOWER), SHIELD, RP-55	
107	⚠1-551-964-00	CORD, POWER	
108	2-832-007-00	BUSHING (K), INSULATING	
109	♠:A-6728-710-A	RP-8 BOARD, COMPLETE	
110	3-701-754-00	PLATE, INSULATING	
111	♠:1-610-589-00	PS-29 BOARD	
112	⚠2-231-019-00	CLAMPER, CORD	
113	♠:1-610-595-00	CI-5 BOARD	
114	3-681-112-00	SHEET, RADIATION	
115	8-927-137-00	SPEAKER UNIT (030F010) SP901	
116	3-681-915-00	HOLDER, SPEAKER	
117	♠:3-679-292-00	COVER, SELECTION, FREQUENCY	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

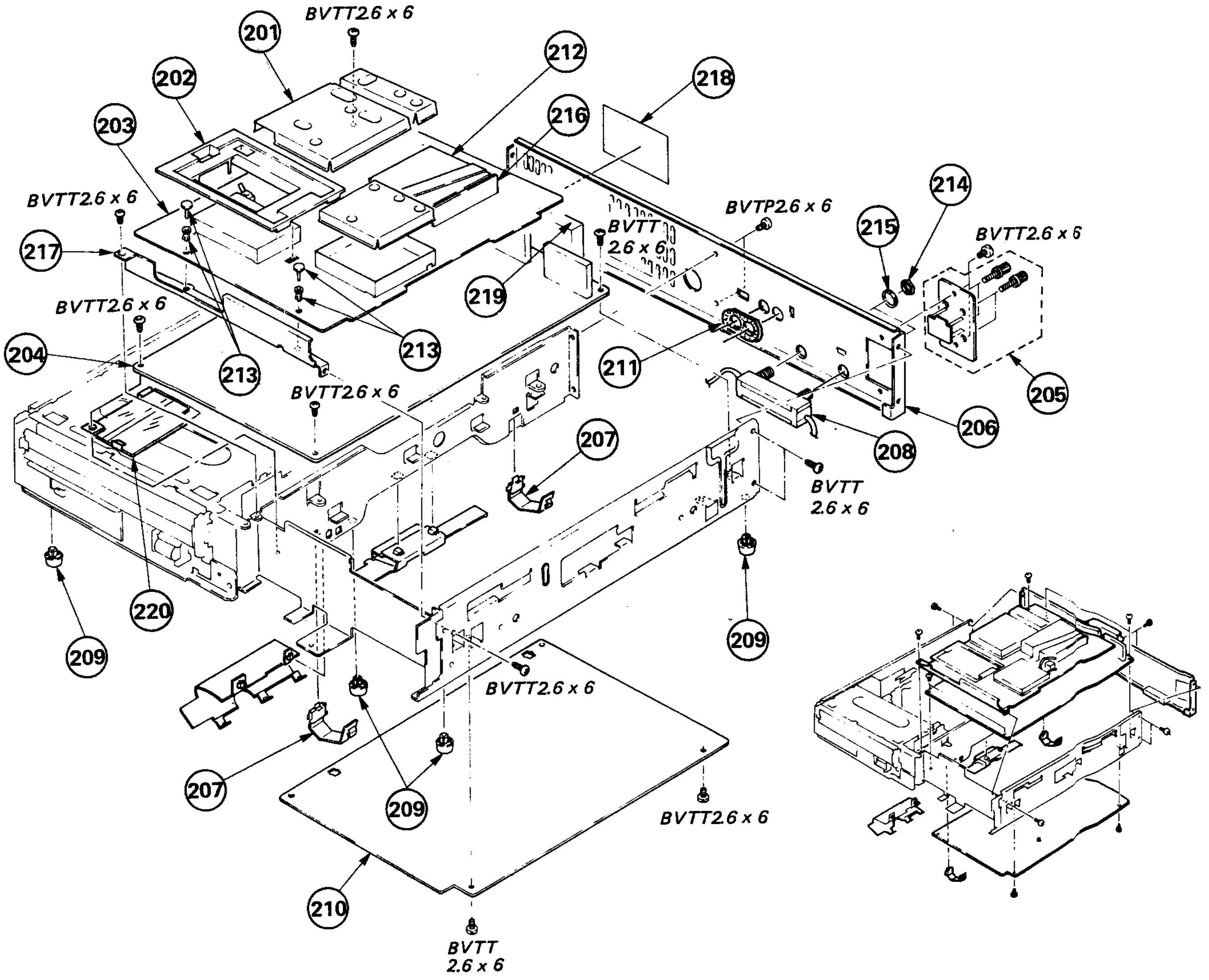
5-4. TIMER FRAME ASSEMBLY



164
163
160
162
161
BVTT
2.6 x 6
153
166
BVTT2.6 x 6
171
PTP2.6 x 8
167
168
152
170
159
PTP2.6 x 8
165
169
151
157
158
154
155
156

No.	Part No.	Description	Remark
151	3-681-902-00	KNOB, TRACK CONTROL	
152	●:1-610-596-00	FS-29 BOARD	
153	●:1-610-857-00	TS-35 BOARD	
154	3-681-901-00	BUTTON, CHANNEL	
155	●:1-610-858-00	TS-36 BOARD	
156	●:2-291-025-00	SPRING, LEAF	
157	●:1-610-598-00	FS-33 BOARD	
158	●:1-610-694-00	JK-6 BOARD	
159	●:1-610-856-00	TS-31 BOARD	
160	3-681-943-00	HOLDER LAMP (6)	
161	●:1-609-219-00	FS-19 BOARD	
162	3-681-914-00	BUTTON, SELECTION	
163	●:1-610-597-00	FS-28 BOARD	
164	3-681-924-00	PLATE, BLIND	
165	●:A-6728-810-A	TS-30 BOARD, COMPLETE	
166	●:4-342-117-00	CASE, SHIELD (MAIN), R	
167	●:1-606-794-00	N BOARD	
168	●:4-342-118-00	LID, SHIELD CASE, R	
169	●:3-681-955-00	BRACKET, TT	
170	3-681-945-00	SHEET PROTECTION (B)	
171	3-681-944-00	SHEET PROTECTION (A)	

5-5. FRAME ASSEMBLY

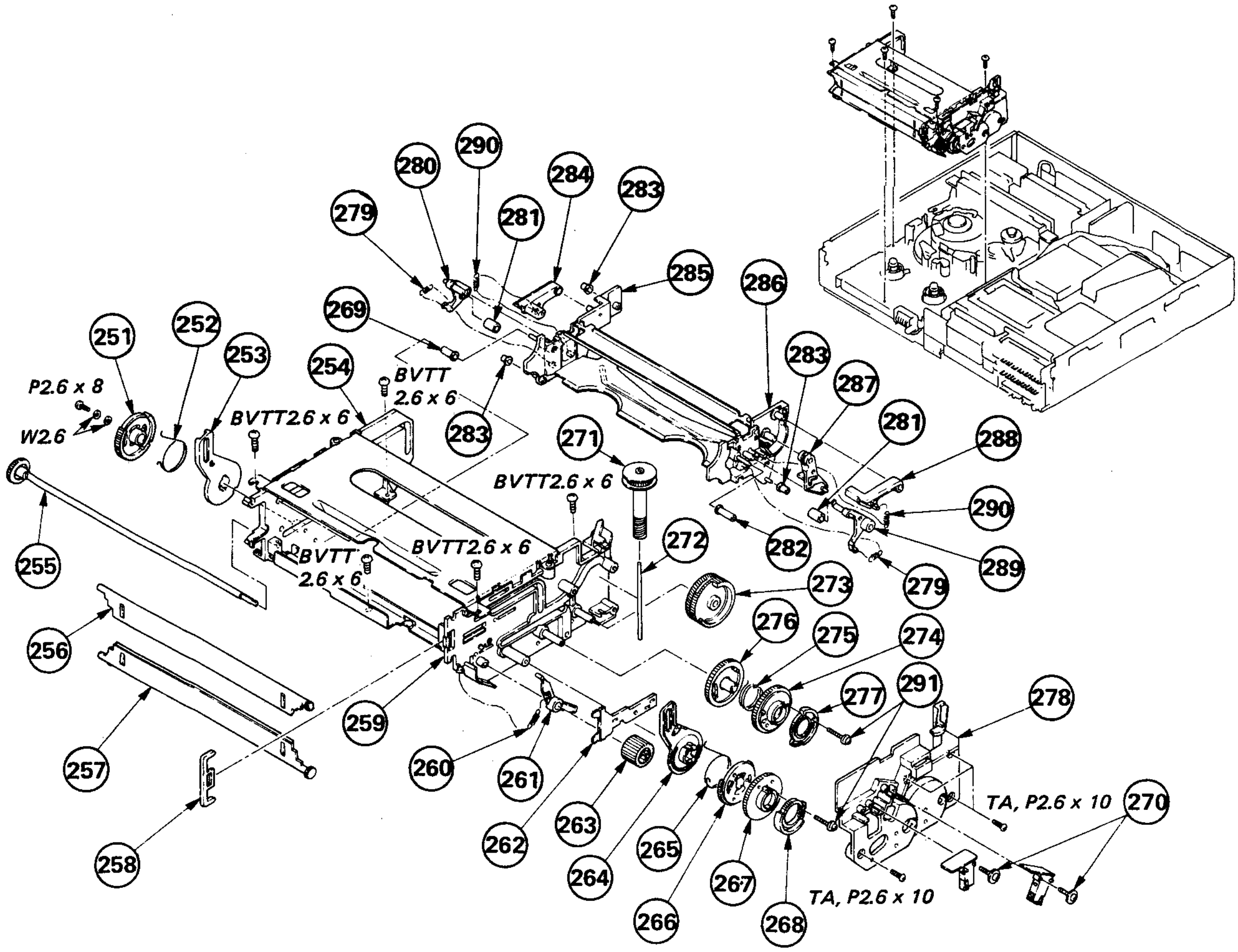


No.	Part No.	Description	Remark
201	●:3-679-238-00	CASE (UPPER), SHIELD, AU-44	
202	3-679-302-00	COVER, PRESET	
203	●:A-6721-183-A	TA-16 BOARD, COMPLETE	
204	●:A-6711-467-A	YC-27 BOARD, COMPLETE	
205	1-417-092-00	DISTRIBUTOR, ANTENNA (UHF) TB991	
206	3-681-951-00	PANEL, REAR	
207	●:3-679-229-00	HINGE, SS	
208	1-554-372-21	SWITCH, ANTENNA CHANGE S996	
209	3-670-155-00	LEG	
210	●:A-6717-333-A	SS-13 (B-299) BOARD, COMPLETE	
211	●:3-681-940-00	PLATE, BLIND, JACK	
212	⚠.1-463-399-00	TUNER (BT-866)	
213	●:4-812-134-11	RIVET NYLON, 3.5	
214	●:3-679-280-00	NUT, HEXAGON	
215	●:3-679-281-00	SPACER, FLAT	
217	3-681-946-00	BRACKET, TA	
218	●:3-681-950-00	LABEL, MODEL NUMBER (SL-2410 USA MODEL)	
	●:3-681-947-00	LABEL, MODEL NUMBER (SL-2410 CANADIAN MODEL)	
	●:3-681-952-00	LABEL, MODEL NUMBER (SL-2415 USA MODEL)	
219	⚠.1-464-266-00	RF UNIT, COLOR (RFU-702) MD01	
220	●:X-3679-188-0	PLATE ASSY, SHIELD, YC	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

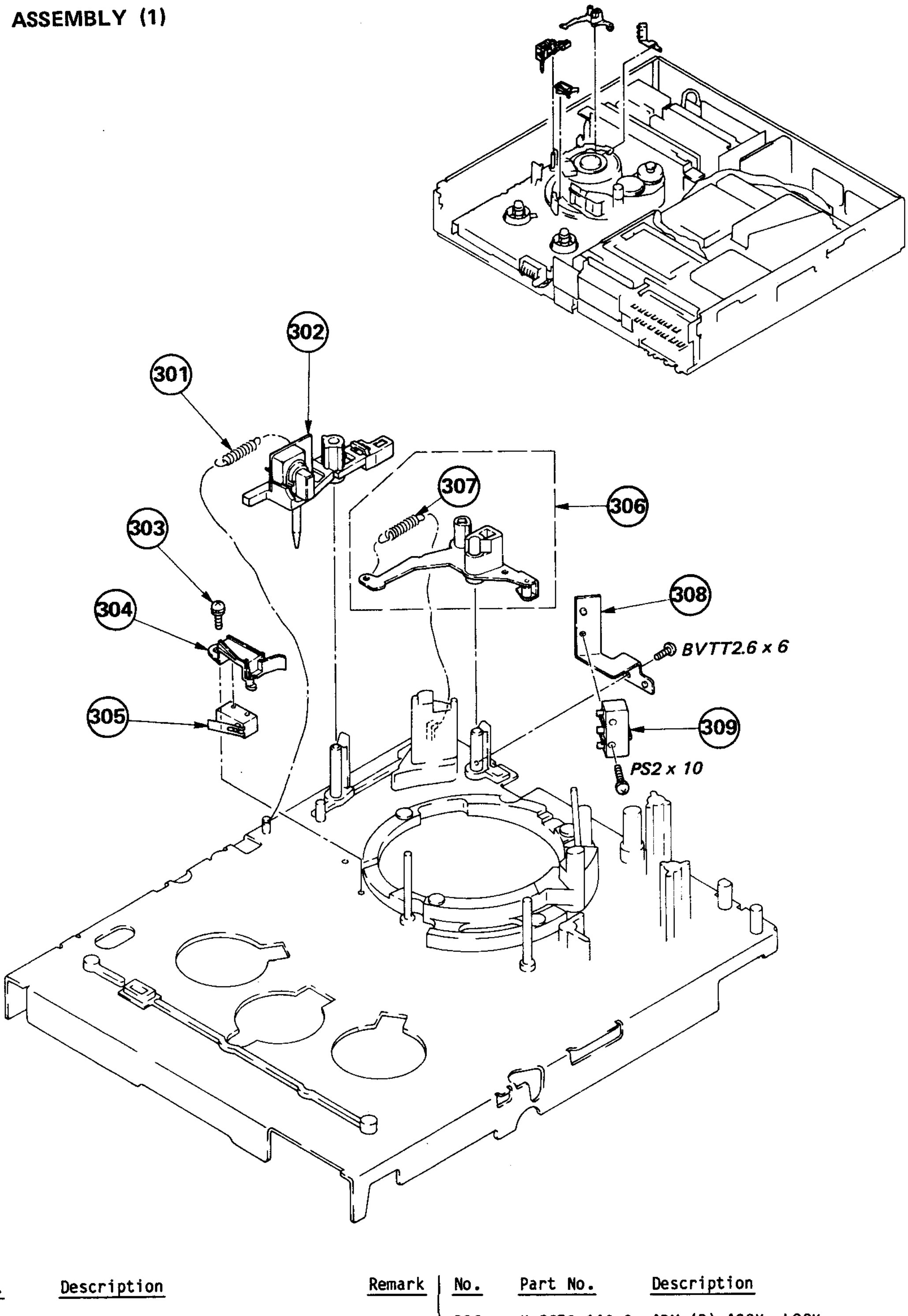
Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-6. FRONT LOADING ASSEMBLY


280
290
284
283
279
281
285
286
269
251
252
253
254
P2.6 x 8
W2.6
BVTT2.6 x 6
BVTT 2.6 x 6
283
271
BVTT2.6 x 6
283
287
281
288
290
272
282
BVTT 2.6 x 6
BVTT2.6 x 6
255
273
279
289
256
276
275
274
277
291
278
259
257
260
261
263
262
265
264
267
266
268
TA, P2.6 x 10
270
TA, P2.6 x 10
258

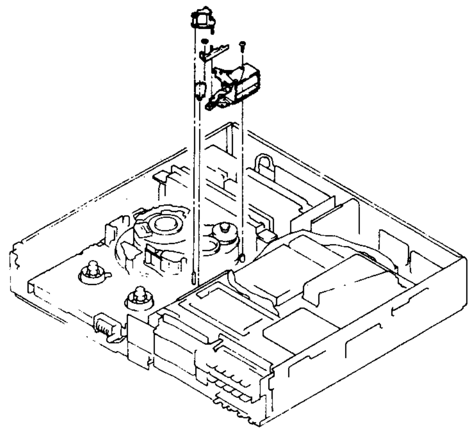
No.	Part No.	Description	Remark
251	3-679-226-00	GEAR (LEFT), ARM, DRIVING	
252	3-679-145-00	SPRING (LEFT)	
253	3-679-220-00	ARM (LEFT), DRIVING	
254	♦:3-679-266-00	PLATE, SIDE, LEFT	
255	X-3679-105-0	SHAFT ASSY, GEAR, MIDWAY	
256	3-679-222-00	DOOR, UPPER	
257	3-679-223-00	DOOR, LOWER	
258	3-679-137-00	HOLDER, OUTER DOOR	
259	♦:3-679-265-00	PLATE, SIDE, RIGHT	
260	3-679-189-00	SPRING, TENSION	
261	3-679-134-00	ARM, SWITCHING, DOOR	
262	3-679-221-00	PLATE, RACK, SWITCHING, DOOR	
263	3-679-126-00	GEAR (RIGHT), MIDWAY	
264	3-679-219-00	ARM (RIGHT), DRIVING	
265	3-679-144-00	SPRING (RIGHT)	
266	3-679-225-00	GEAR (RIGHT), ARM, DRIVING	
267	3-679-125-00	GEAR, DRIVING	
268	3-679-138-00	CAM (CASSETTE ON)	
269	3-679-316-00	ROLLER (LEFT), DRIVING	
270	3-669-480-00	+ PTPWH 2	
271	3-679-215-00	GEAR, WORM	
272	3-679-123-00	SHAFT, GEAR, WORM	
273	3-679-216-00	WHEEL, WORM	
274	3-679-218-00	GEAR (B), LIMITER	
275	3-679-139-00	SPRING	
276	3-679-217-04	GEAR (A), LIMITER	
277	3-679-124-00	CAM (CASSETTE OFF)	
278	♦:3-679-214-00	HOLDER, GEAR, WORM	
279	3-679-288-00	SPRING, TENSION	
280	3-679-130-00	LEVER (LEFT), RETAINER, CASSETTE	
281	3-679-135-00	RUBBER, RETAINER, CASSETTE	
282	3-679-128-00	ROLLER (RIGHT), DRIVING	
283	3-679-143-00	ROLLER	
284	3-679-132-00	LEVER (LEFT), PREVENTION	
285	♦:X-3679-107-0	PLATE ASSY, SIDE, BASE LEFT	
286	♦:X-3679-106-0	PLATE ASSY, SIDE, BASE RIGHT	
287	3-679-133-00	ARM, LID OPEN	
288	3-679-131-00	LEVER (RIGHT), PREVENTION	
289	3-679-129-00	LEVER(RIGHT), RETAINER, CASSETTE	
290	3-679-188-00	SPRING, TENSION	
291	3-669-480-11	+ PTPWH 2	

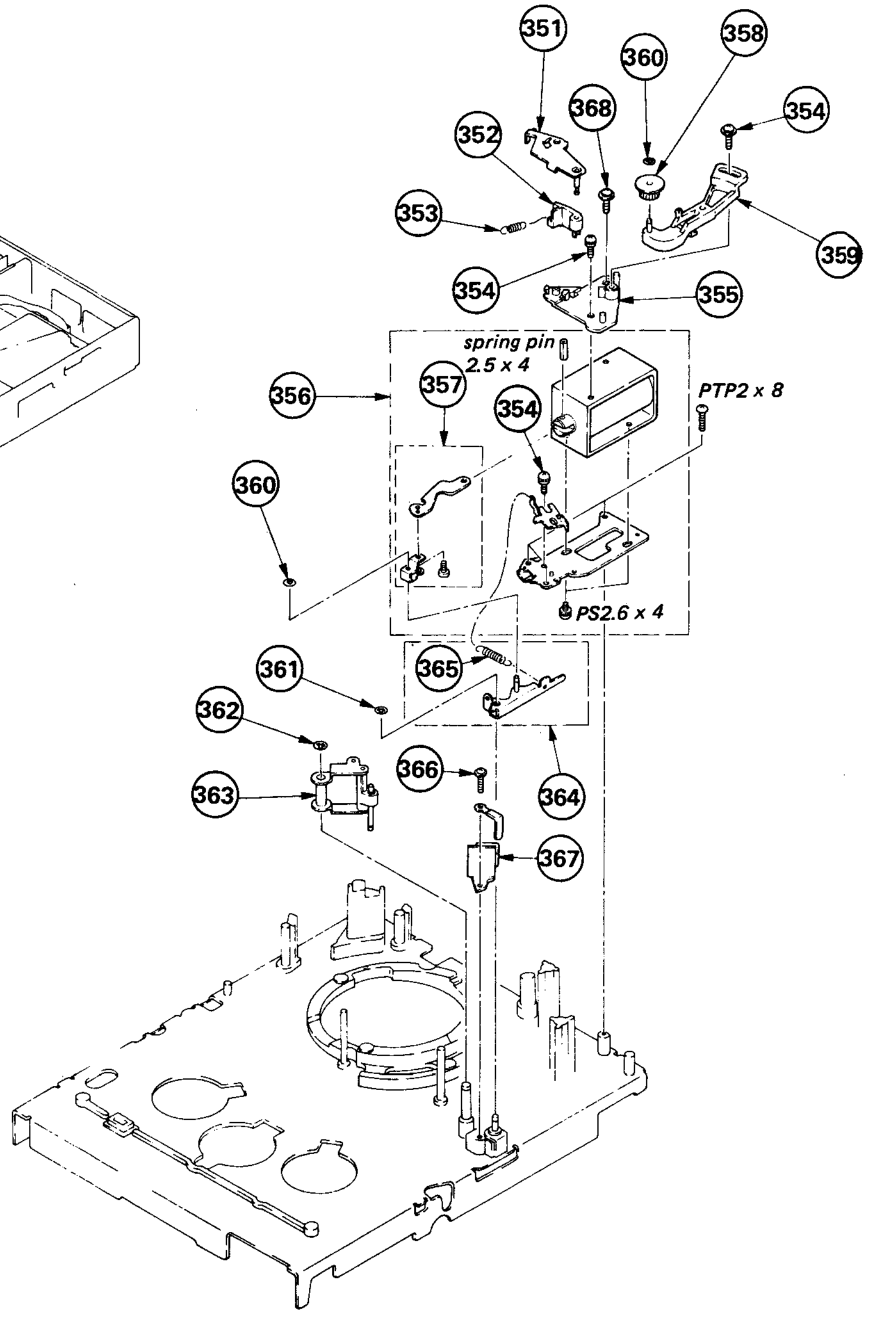
5-7. CHASSIS ASSEMBLY (1)


302
301
307
306
303
304
308
BVTT2.6 x 6
305
309
PS2 x 10

No.	Part No.	Description	Remark
301	3-679-164-00	SPRING, TENSION	
302	1-464-249-00	SENSOR, S COIL L991	
303	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
304	♣:3-669-355-00	HOLDER, SWITCH, ULE	
305	1-553-718-00	SWITCH, MICRO S994	
306	X-3679-149-0	ARM (B) ASSY, LOCK	307
307	3-679-323-00	SPRING, TENSION	
308	♣:3-672-542-00	BRACKET, SWITCH, LE	
309	1-553-539-00	SWITCH, MICRO S993	

5-8. CHASSIS ASSEMBLY (2)



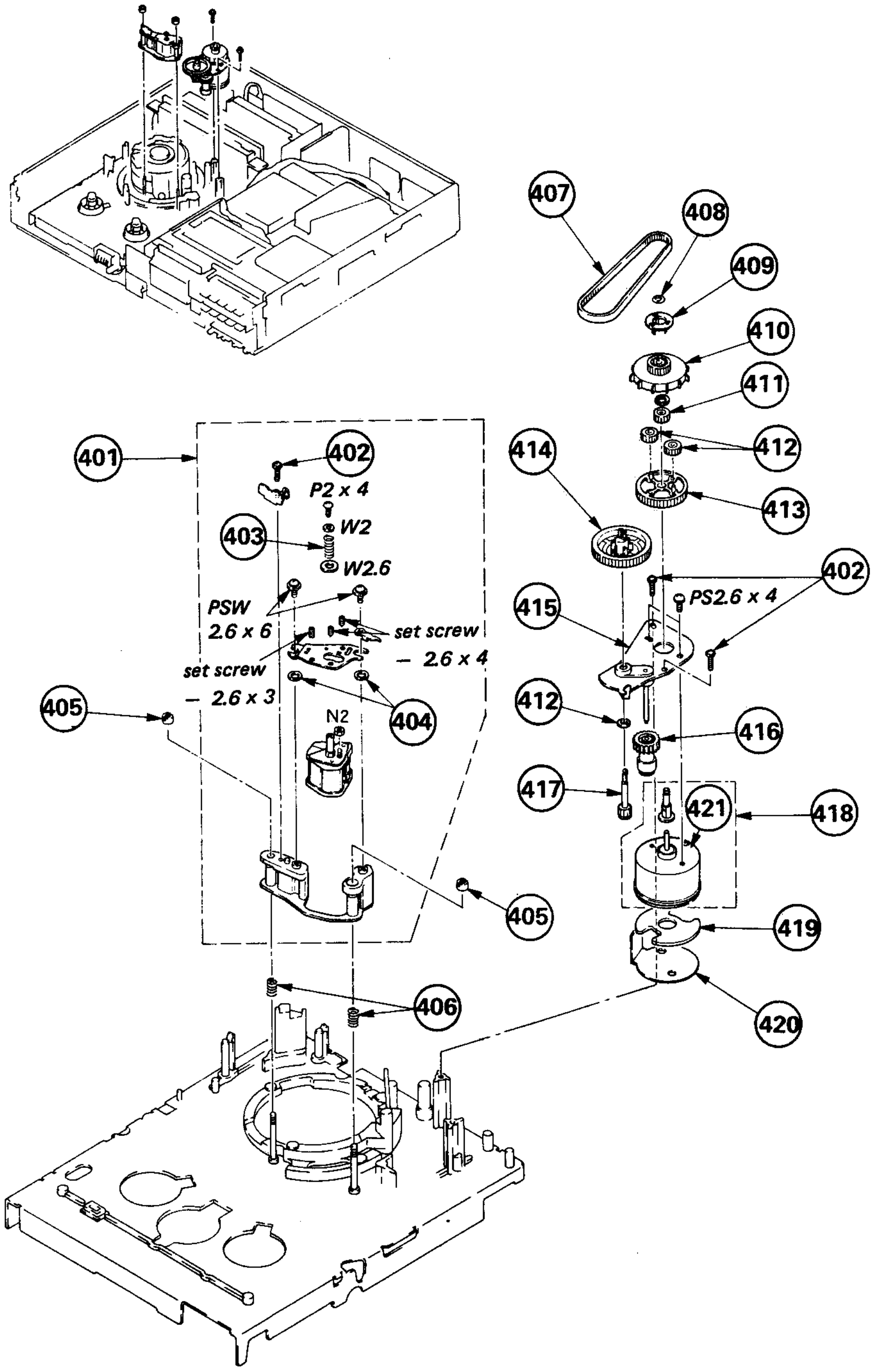

351
360
358
368
354
352
353
359
354
355
spring pin
2.5 x 4
356
357
354
PTP2 x 8
360
PS2.6 x 4
361
365
362
366
364
363
367

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

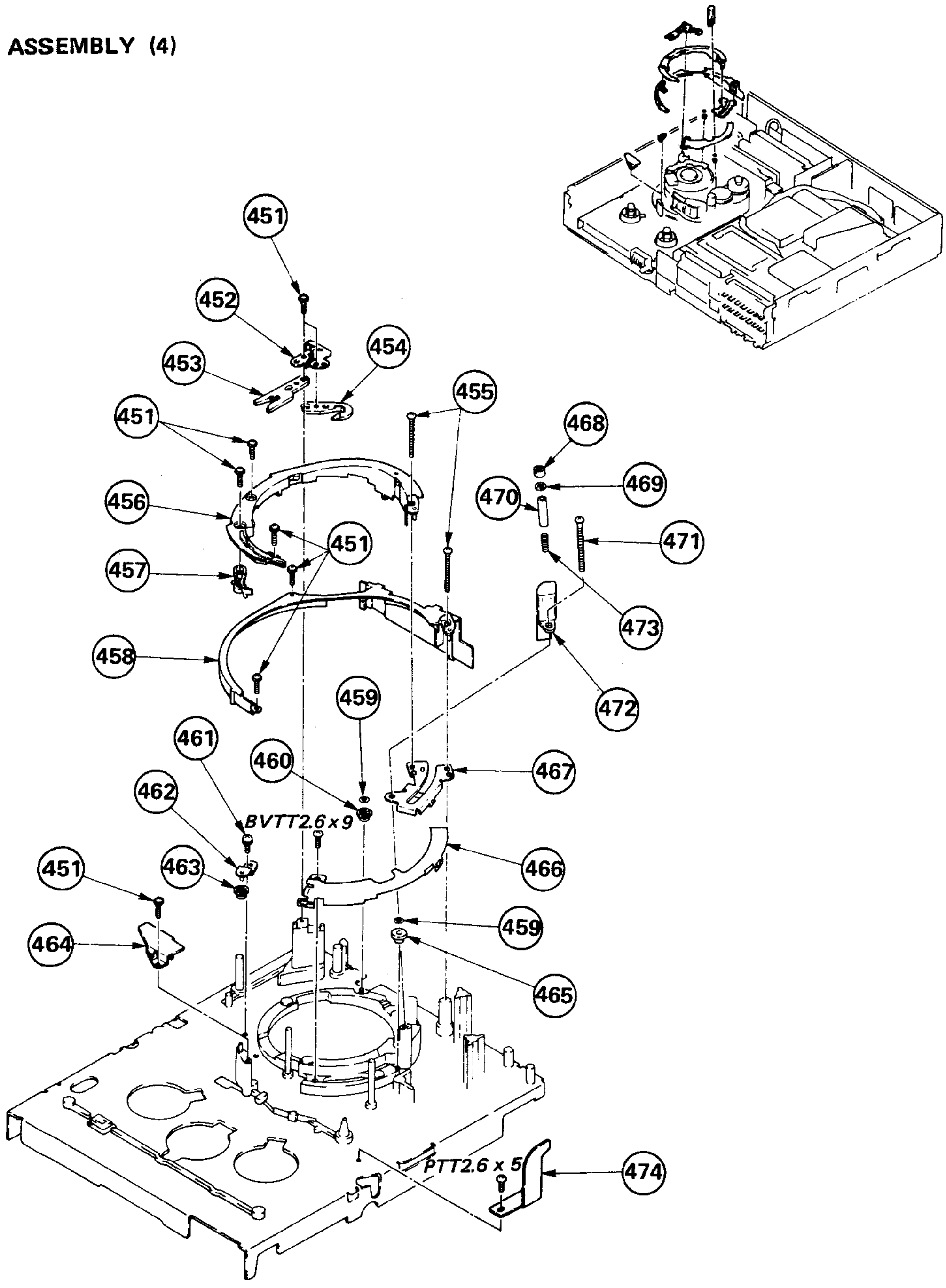
No.	Part No.	Description	Remark
351	♦:X-3679-123-0	ARM ASSY, STOPPER	
352	♦:3-679-251-00	LIMITER, STOPPER	
353	3-508-108-XX	SPRING, TENSION	
354	3-681-231-00	SCREW (+PW2.6X8), TAPPING	
355	♦:3-679-117-05	CHASSIS, ARM, STOPPER	
356	⚠A-6749-080-A	SOLENOID BLOCK ASSY (PINCH)	357,354
357	X-3679-152-0	ARM (B) ASSY, PINCH SOLENOID	
358	3-679-307-00	GEAR, TENSION	
359	♦:X-3679-145-0	ARM ASSY, CAR, TENSION	
360	3-669-465-00	WASHER (1.5), STOPPER	
361	3-669-595-00	WASHER (2), STOPPER	
362	3-669-596-00	WASHER (2.3), STOPPER	
363	♦:X-3679-108-0	ARM ASSY, PRESS, PINCH	
364	♦:X-3669-379-0	ARM (P) ASSY, PINCH LIMITER	⊒365
365	3-465-159-XX	SPRING, TENSION	
366	3-669-480-11	+ PTPWH 2	
367	1-464-250-00	SENSOR, T COIL L992	
368	3-681-231-00	SCREW (+PW 2.6X8), TAPPING	

5-9. CHASSIS ASSEMBLY (3)


407
408
409
410
411
401
402
P2 x 4
W2
403
W2.6
414
412
413
402
PS2.6 x 4
PSW
2.6 x 6
set screw
– 2.6 x 4
set screw
– 2.6 x 3
415
405
404
N2
412
416
417
421
418
405
419
406
420

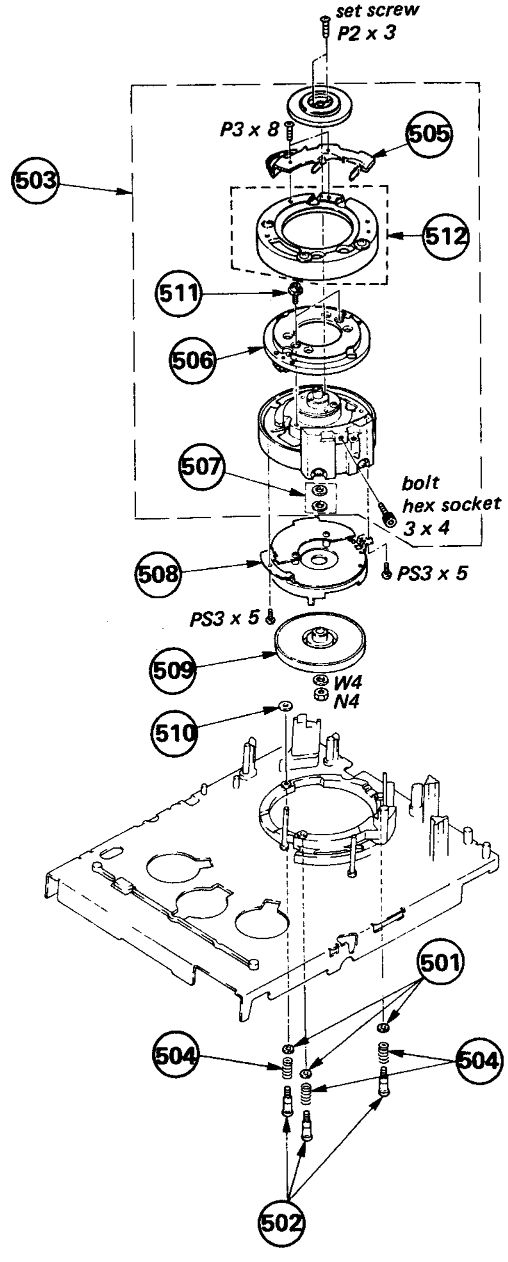
No.	Part No.	Description	Remark
401	A-6761-056-A	ACE ASSY (AUDIO, AUDIO ERASE, CTL)	402,403,404
402	3-669-480-21	+ PTPWH 2	
403	♠:3-669-316-00	SPRING, COMPRESSION	
404	3-669-598-00	WASHER, CTL	
405	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
406	3-669-317-00	SPRING, COMPRESSION	
407	3-679-119-00	BELT, SYNCHRO	
408	3-669-596-00	WASHER (2.3), STOPPER	
409	3-679-140-00	FLANGE, GEAR, INTERNAL	
410	3-679-101-00	GEAR, INTERNAL	
411	3-679-104-00	GEAR	
412	3-701-439-11	WASHER	
413	X-3679-111-0	CARRIER ASSY	
414	3-679-115-00	GEAR (LARGE), LOADING	
415	♠:X-3679-112-0	CHASSIS ASSY, GEAR, PLANET	
416	X-3669-321-0	GEAR (C) ASSY	
417	3-679-114-00	GEAR (SMALL), LOADING	
418	A-6737-118-A	MOTOR ASSY, L (LOADING MOTOR)	421
419	♠:1-605-071-00	LM-8 BOARD	
420	♠:3-669-613-00	INSULATOR, L MOTOR	
421	1-541-163-00	MOTOR M904	

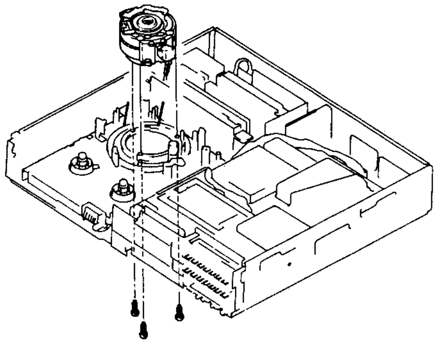
5-10. CHASSIS ASSEMBLY (4)


451
452
453
454
451
455
468
469
470
456
451
471
457
473
458
472
459
461
460
467
462
BVTT2.6x9
466
451
463
459
464
465
PTT2.6 x 5
474

No.	Part No.	Description	Remark
451	3-669-480-11	+ PTPWH 2	
452	♠:3-672-540-00	PLATE, GROUND, TAPE GUIDE	
453	♠:3-669-618-00	PLATE (2), ADJUST	
454	♠:3-672-507-00	PLATE (3-1), ADJUSTMENT	
455	3-669-466-00	SCREW (M 2.6)	
456	♠:3-679-290-00	GUIDE (1-YA), SHUTTLE	
457	X-3669-327-0	ARM ASSY, SWITCH, ULE	
458	♠:3-669-585-00	GUIDE (2), SHUTTLE	
459	3-669-465-00	WASHER (1.5), STOPPER	
460	3-669-630-00	ROLLER (C), RING	
461	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
462	♠:X-3669-329-0	PLATE ASSY, ADJUSTMENT	
463	3-669-360-00	ROLLER, RING	
464	♠:3-669-476-04	PLATE, GUIDE	
465	3-669-597-00	ROLLER (B), RING	
466	♠:3-669-477-00	LINER, LINK, PIN	
467	♠:X-3669-313-0	BASE ASSY, SLANT	
468	3-669-446-00	NUT, GUIDE, NO. 6	
469	3-669-447-00	FLANGE, GUIDE, NO. 6	
470	3-669-445-00	SPACER, GUIDE, NO. 6	
471	3-669-606-00	SCREW (2.6)	
472	8-825-508-10	HEAD, FE (FULL ERASE)	
473	3-669-615-00	SPRING, COMPRESSION	
474	♠:3-679-163-00	PLATE, LID OPEN	

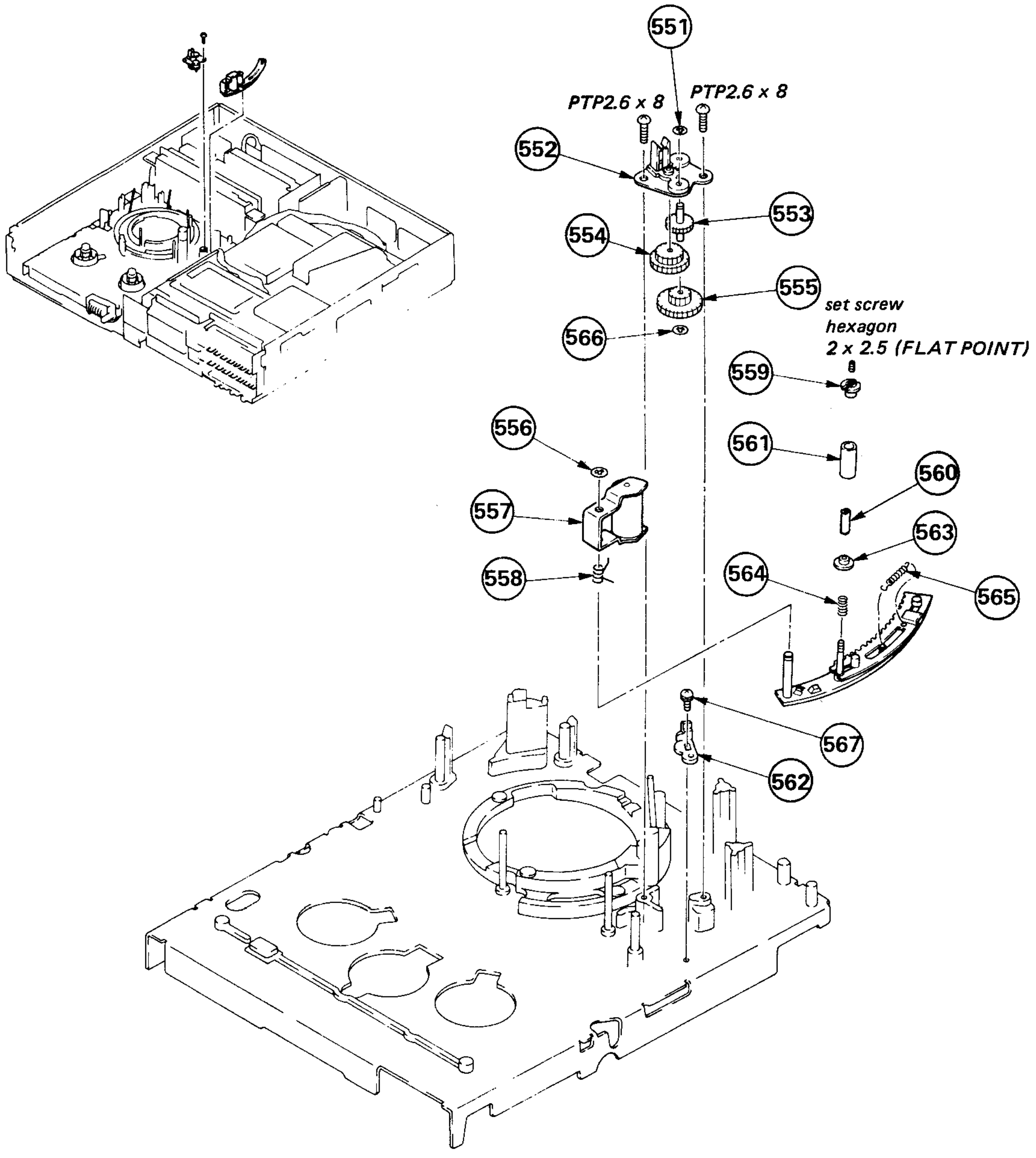
5-11. DRUM ASSEMBLY


set screw
P2 x 3
P3 x 8
505
503
512
511
506
507
bolt
hex socket
3 x 4
508
PS3 x 5
PS3 x 5
509
W4
N4
510
501
504
504
502



No.	Part No.	Description	Remark
501	3-669-600-11	WASHER, FLAT (3.5)	
502	3-669-302-00	SCREW, FITTING	
503	A-6050-176-A	DRUM ASSY (DSH-33B-R)505,506,507,511,512	
504	3-429-123-00	SPRING	
505	A-6760-066-B	SPRING ASSY, TAPE RETANER	
506	A-6762-115-A	DISK ASSY	
507	X-3669-105-0	SPACER BLOCK ASSY	
508	X-2621-204-2	STATOR ASSY, D	
509	X-2621-202-0	ROTOR ASSY, D	
510	♠:3-669-646-00	SPACER, DRUM (T0.05)	
	♠:3-669-646-11	SPACER, DRUM (T0.075)	
511	3-669-157-00	BOLT (WASHER) (2.6X8)	
512	A-6760-123-B	DRUM SUB ASSY, UPPER	

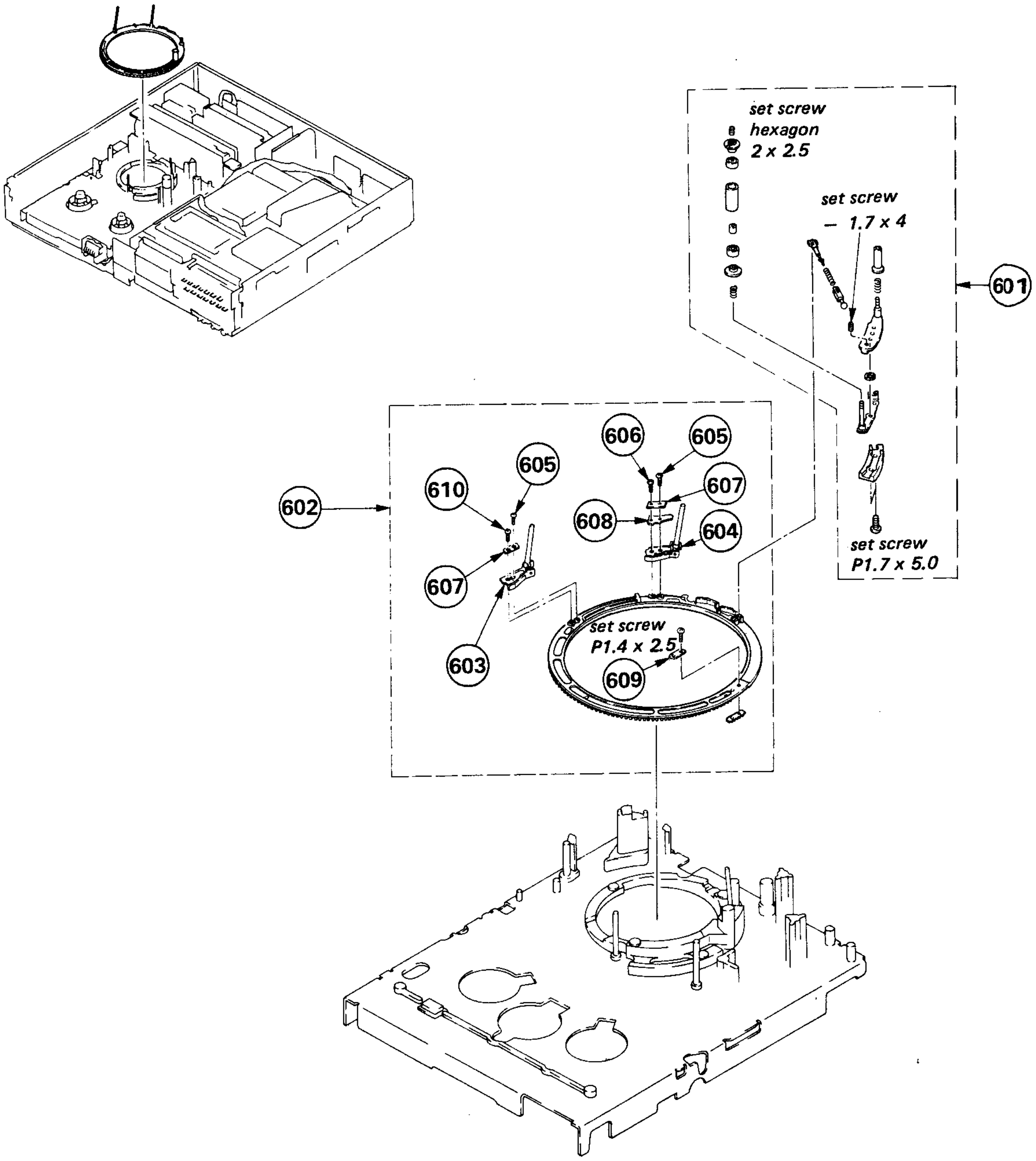
5-12. CHASSIS ASSEMBLY (5)



551
PTP2.6 x 8
PTP2.6 x 8
552
553
554
555
set screw
hexagon
2 x 2.5 (FLAT POINT)
566
559
556
561
560
557
563
558
564
565
567
562

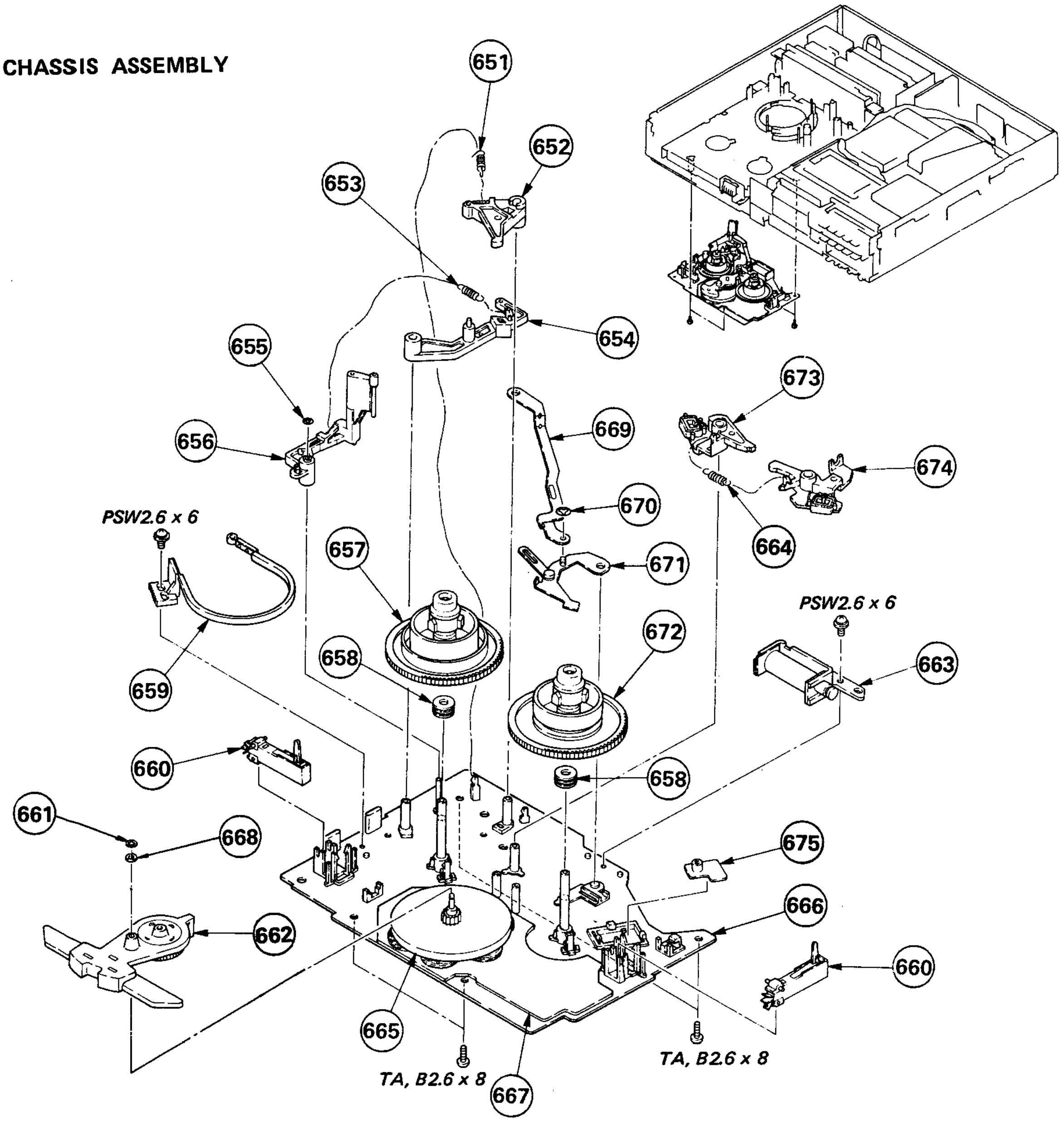
No.	Part No.	Description	Remark
551	3-669-465-00	WASHER (1.5), STOPPER	
552	X-3679-147-0	CHASSIS (B) ASSY, DRIVE GEAR	
553	X-3679-148-0	GEAR (F) ASSY (B)	
554	3-669-338-00	GEAR (E)	
555	3-669-337-00	GEAR (D)	
556	3-669-596-00	WASHER (2.3), STOPPER	
557	X-3669-307-6	ARM ASSY, PINCH ROLLER	
558	3-669-444-00	SPRING, TORSION	
559	3-676-650-00	FLANGE (UPPER)(#9), GUIDE	
560	3-672-559-00	SLEEVE, GUIDE	
561	3-676-649-00	ROLLER (#9), GUIDE	
562	●:3-679-165-00	STOPPER, SLIDER	
563	3-672-558-00	FLANGE (LOWER)(#9), GUIDE	
564	3-669-452-00	SPRING, COMPRESSION	
565	3-549-014-00	SPRING, TENSION	
566	3-669-595-00	WASHER (2), STOPPER	
567	●:3-669-613-00	INSULATOR, L MOTOR	

5-13. CHASSIS ASSEMBLY (6)


set screw
hexagon
2 x 2.5
set screw
– 1.7 x 4
601
set screw
P1.7 x 5.0
606
605
605
610
607
602
608
604
607
set screw
P1.4 x 2.5
609
603

No.	Part No.	Description	Remark
601	A-6750-108-B	SHUTTLE BLOCK ASSY, THREADING	
602	X-3679-150-0	RING (YA) ASSY, S LOADING 603-610	
603	♠:X-3669-429-0	HOLDER BLOCK ASSY, #2 GUIDE	
604	♠:X-3669-430-0	HOLDER BLOCK ASSY, #3 GUIDE	
605	3-669-478-00	SCREW (1X3), TAPPING	
606	3-669-479-11	SCREW (1.4X3.5), TAPPING	
607	♠:3-669-472-02	RETAINER, SPRING, LEAF	
608	3-672-583-00	SPRING	
609	♠:3-669-616-00	RETAINER	
610	3-672-586-00	SCREW (1.4X3), TAPPING	

5-14. REEL CHASSIS ASSEMBLY



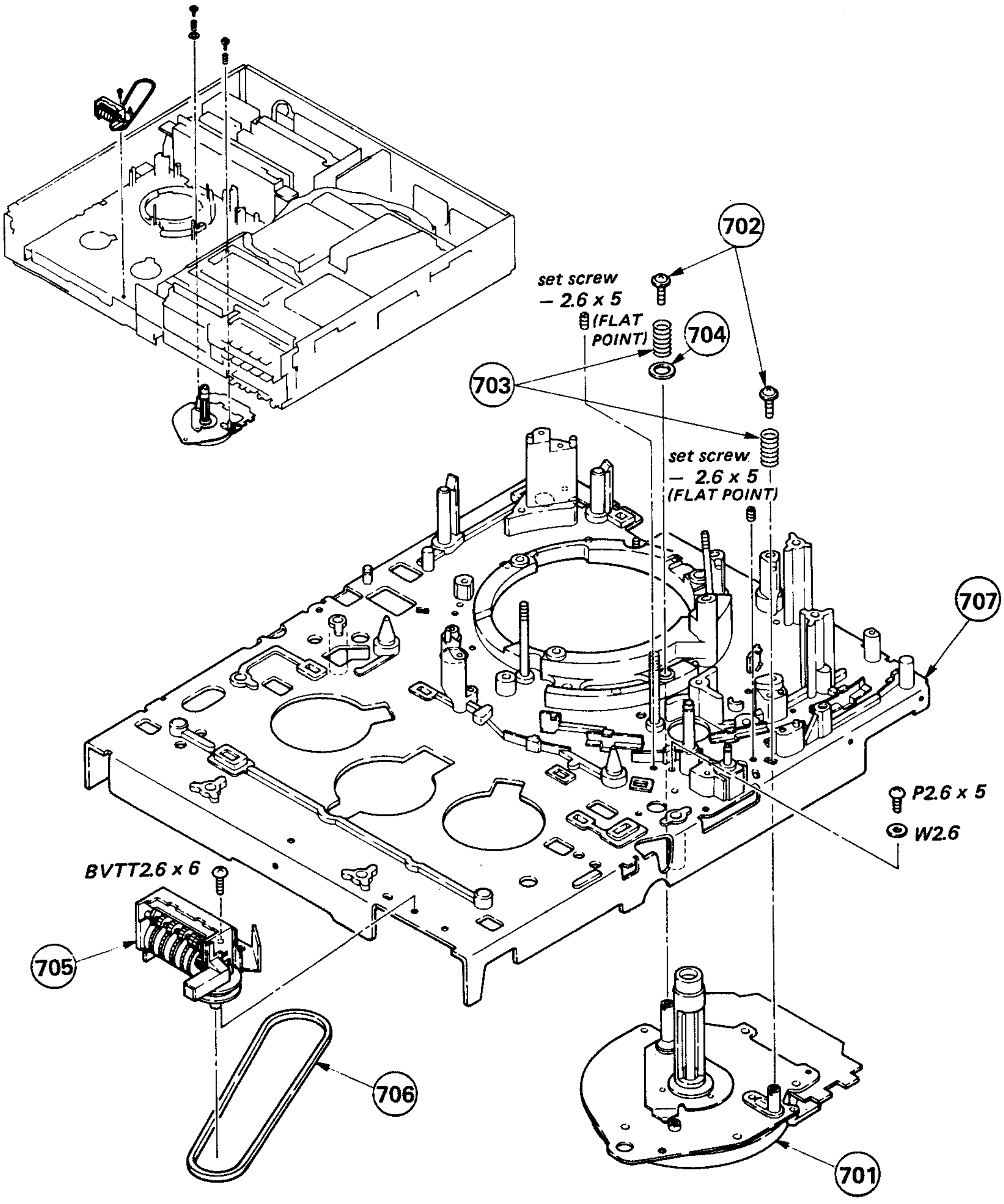
No.	Part No.	Description	Remark
651	3-679-156-00	SPRING, TENSION	
652	♠:3-679-231-00	LEVER, BRAKE, SOFT	
653	3-679-151-00	SPRING, TENSION	
654	♠:3-679-230-00	LEVER, FUNCTION	
655	3-669-465-00	WASHER (1.5), STOPPER	
656	X-3679-122-0	LEVER ASSY, TENSION REGULATOR	
657	X-3679-115-0	TABLE ASSY, REEL, S	
658	3-646-185-00	BEARING	
659	X-3679-120-0	BAND ASSY, TENSION REGULATOR	
660	1-554-374-00	SWITCH, LEVER S991, S992	
661	3-669-595-00	WASHER (2), STOPPER	
662	A-6759-074-H	ARM BLOCK ASSY, PENDLUM	
663	⚠1-454-348-00	SOLENOID, BRAKE PLUNGER PM902	
664	3-679-190-00	SPRING, TENSION	

No.	Part No.	Description	Remark
665	X-2622-201-3	ROTOR ASSY, R (REEL MOTOR)	
666	♠:X-3679-130-0	CHASSIS ASSY, SUB	
667	♠:A-4910-021-A	R STATOR BOARD, COMPLETE (REEL MOTOR)	
668	3-679-318-00	WASHER, PENDULUM ARM	
669	♠:3-679-168-00	JOINT, BRAKE, L	
670	3-669-596-00	WASHER (2.3), STOPPER	
671	X-3679-119-0	ARM ASSY, STOPPER, PENDULUM	
672	X-3679-116-0	TABLE ASSY, REEL, T	
673	X-3679-117-0	BRAKE ASSY, S	
674	X-3679-118-0	BRAKE ASSY, T	
675	♠:1-609-231-00	RD-5 BOARD	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-15. CHASSIS ASSEMBLY (7)


702
set screw
– 2.6 x 5
(FLAT POINT)
704
703
set screw
– 2.6 x 5
(FLAT POINT)
707
P2.6 x 5
W2.6
BVTT2.6 x 6
705
706
701

No.	Part No.	Description	Remark
701	8-838-042-01	MOTOR, DC (BHF-1907A)(CAPSTAN MOTOR)	M902
702	3-669-633-00	SCREW, + PW2	
703	3-679-359-00	SPRING, COMPRESSION	
704	3-669-697-00	SPACER, CAPSTAN	
705	1-548-571-00	COUNTER, TAPE (MIDDLE TYPE)	
706	3-679-171-00	BELT, COUNTER	
707	♠:X-3679-132-0	CHASSIS ASSY, MECHANICAL	

HARDWARE LIST

SCREW

7-621-759-35	+PSW, 2.6X5
7-621-759-45	+PSW, 2.6X6
7-685-531-19	SCREW +BTP 2.6X4 TYPE2 N-S
7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
7-685-880-01	SCREW +BVTT 4X6 (S)
7-685-860-01	SCREW +BVTT 2.6X4 (S)
7-685-862-01	SCREW +BVTT 2.6X6 (S)
7-685-862-09	SCREW +BVTT 2.6X6 (S)
7-685-863-01	SCREW +BVTT 2.6X8 (S)
7-685-135-11	SCREW +P 2.6X10 TYPE2 NON-SLIT
7-621-259-32	SCREW +P 2.6X5
7-621-259-35	SCREW +P 2.6X5
7-685-132-29	SCREW +P 2.6X5 TYPE2 SLIT
7-621-259-45	SCREW +P 2.6X6
7-685-134-11	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-628-253-45	SCREW +PS 2X10
7-628-253-95	SCREW +PS 2.6X4
7-685-791-01	SCREW +PTT 2.6X5 (S)
7-627-551-08	SCREW, PRECISION +P 1.4X1.6
7-627-551-28	SCREW, PRECISION +P 1.4X2.5

SET-SCREW

7-621-712-26	SET-SCREW, SLOT 2.6X3FLAT POINT
7-621-712-35	SET-SCREW, SLOT 2.6X4CONE POINT
7-621-712-46	SET-SCREW, SLOT 2.6X5FLAT POINT
7-621-731-08	SET-SCT, HEX. 2X2.5, FLAT POINT
7-621-714-26	SET-SCREW, SLOT 1.7X4 FLAT POINT

SPRING PIN

7-626-302-31	SPRING PIN, 2.5X14

NUT

7-622-205-05	N 2, TYPE 2

TAPPING PIN

7-685-105-11	TPG +P 2X8, TYPE 2, NON-SLIT

WASHER

7-688-002-11	W 2.6, MIDDLE
7-688-004-01	W 4, SMALL

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

- Items marked " ♠ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
- MF : μF, PF : μμF

RESISTORS
- All resistors are in ohms
- F : nonflammable

COILS
- MMH : mH, UH : μH

Ref.No.	Part No.	Description			Remark
	♠:A-6711-467-A	YC-27 BOARD, COMPLETE			
		**********************			
	♠:1-560-890-00	PIN, CONNECTOR 2P			
	♠:3-655-214-00	CLIP, CABLE			
	♠:3-661-659-00	CASE (MAIN), SHIELD			
	♠:3-671-251-00	CASE (REAR PLATE), SHIELD			
		CAPACITOR			
C001	1-161-068-00	CERAMIC	0.0047MF	20%	50V
C002	1-102-074-00	CERAMIC	0.001MF	10%	50V
C003	1-123-328-00	ELECT	4.7MF	20%	25V
C004	1-123-332-00	ELECT	47MF	20%	16V
C005	1-161-070-00	CERAMIC	0.01MF	20%	50V
C006	1-123-307-00	ELECT	100MF	20%	10V
C007	1-123-354-00	ELECT	3.3MF	20%	50V
C008	1-161-070-00	CERAMIC	0.01MF	20%	50V
C009	1-102-973-00	CERAMIC	100PF	5%	50V
C010	1-102-945-00	CERAMIC	8PF	1PF	50V
C011	1-161-070-00	CERAMIC	0.01MF	20%	50V
C012	1-102-499-00	CERAMIC	120PF	5%	50V
C013	1-102-973-00	CERAMIC	100PF	5%	50V
C014	1-102-820-00	CERAMIC	330PF	5%	50V
C015	1-123-356-00	ELECT	10MF	20%	16V
C016	1-161-010-00	CERAMIC	0.0056MF	10%	25V
C017	1-123-379-00	ELECT	0.47MF	20%	50V
C018	1-102-116-00	CERAMIC	680PF	10%	50V
C019	1-130-514-00	MYLAR	0.0068MF	10%	50V
C020	1-130-508-00	MYLAR	0.0022MF	10%	50V
C021	1-123-332-00	ELECT	47MF	20%	16V
C022	1-161-013-00	CERAMIC	0.01MF	10%	25V
C023	1-123-307-00	ELECT	100MF	20%	10V
C024	1-123-379-00	ELECT	0.47MF	20%	50V
C025	1-101-888-00	CERAMIC	68PF	5%	50V
C026	1-102-110-00	CERAMIC	220PF	10%	50V
C027	1-123-330-00	ELECT	22MF	20%	16V
C028	1-123-381-00	ELECT	2.2MF	20%	50V
C029	1-161-021-00	CERAMIC	0.047MF	10%	25V
C030	1-102-114-00	CERAMIC	470PF	10%	50V
C031	1-161-013-00	CERAMIC	0.01MF	10%	25V
C032	1-123-305-00	ELECT	33MF	20%	10V
C033	1-102-978-00	CERAMIC	220PF	5%	50V
C034	1-130-495-00	MYLAR	0.1MF	5%	50V
C035	1-161-021-00	CERAMIC	0.047MF	10%	25V
C036	1-123-305-00	ELECT	33MF	20%	10V
C037	1-130-489-00	MYLAR	0.033MF	5%	50V
C038	1-123-356-00	ELECT	10MF	20%	16V
C039	1-102-074-00	CERAMIC	0.001MF	10%	50V
C040	1-102-962-00	CERAMIC	30PF	5%	50V
C041	1-101-882-00	CERAMIC	51PF	5%	50V
C042	1-102-114-00	CERAMIC	470PF	10%	50V
C043	1-102-962-00	CERAMIC	30PF	5%	50V
C044	1-161-013-00	CERAMIC	0.01MF	10%	25V
C045	1-102-973-00	CERAMIC	100PF	5%	50V
C046	1-102-117-00	CERAMIC	820PF	10%	50V
C047	1-123-356-00	ELECT	10MF	20%	16V
C048	1-102-973-00	CERAMIC	100PF	5%	50V
C049	1-161-013-00	CERAMIC	0.01MF	10%	25V
C050	1-161-013-00	CERAMIC	0.01MF	10%	25V
C051	1-102-116-00	CERAMIC	680PF	10%	50V
C052	1-102-116-00	CERAMIC	680PF	10%	50V
C053	1-161-070-00	CERAMIC	0.01MF	20%	50V
C054	1-123-328-00	ELECT	4.7MF	20%	25V
C055	1-102-117-00	CERAMIC	820PF	10%	50V
C056	1-131-404-00	ELECT(SOLID)	0.22MF	10%	25V
C057	1-161-072-00	CERAMIC	0.022MF	20%	50V
C058	1-123-381-00	ELECT	2.2MF	20%	50V
C059	1-161-070-00	CERAMIC	0.01MF	20%	50V
C060	1-161-070-00	CERAMIC	0.01MF	20%	50V
C061	1-102-935-00	CERAMIC	2PF	0.25PF	50V
C062	1-102-748-00	CERAMIC	11PF	5%	50V
C063	1-161-070-00	CERAMIC	0.01MF	20%	50V
C064	1-102-962-00	CERAMIC	30PF	5%	50V
C065	1-161-070-00	CERAMIC	0.01MF	20%	50V
C066	1-123-333-00	ELECT	100MF	20%	16V
C067	1-102-808-00	CERAMIC	6PF	1PF	50V
C068	1-101-880-00	CERAMIC	47PF	5%	50V
C069	1-102-965-00	CERAMIC	39PF	5%	50V
C070	1-102-947-00	CERAMIC	10PF	5%	50V
C071	1-102-530-00	CERAMIC	120PF	5%	50V
C072	1-102-961-00	CERAMIC	27PF	5%	50V
C073	1-123-332-00	ELECT	47MF	20%	16V
C074	1-123-305-00	ELECT	33MF	20%	10V
C075	1-123-356-00	ELECT	10MF	20%	16V
C076	1-123-318-00	ELECT	33MF	20%	16V
C077	1-161-025-00	CERAMIC	0.1MF	10%	25V
C078	1-123-307-00	ELECT	100MF	20%	10V
C079	1-123-318-00	ELECT	33MF	20%	16V
C080	1-161-013-00	CERAMIC	0.01MF	10%	25V
C081	1-123-356-00	ELECT	10MF	20%	16V
C082	1-123-332-00	ELECT	47MF	20%	16V
C083	1-161-021-00	CERAMIC	0.047MF	10%	25V
C084	1-123-332-00	ELECT	47MF	20%	16V
C085	1-161-070-00	CERAMIC	0.01MF	20%	50V
C086	1-161-070-00	CERAMIC	0.01MF	20%	50V
C087	1-161-021-00	CERAMIC	0.047MF	10%	25V
C088	1-101-888-00	CERAMIC	68PF	5%	50V
C089	1-123-318-00	ELECT	33MF	20%	16V
C090	1-101-884-00	CERAMIC	56PF	5%	50V
C091	1-102-110-00	CERAMIC	220PF	10%	50V
C092	1-123-318-00	ELECT	33MF	20%	16V
C093	1-102-959-00	CERAMIC	22PF	5%	50V
C094	1-161-013-00	CERAMIC	0.01MF	10%	25V
C095	1-123-379-00	ELECT	0.47MF	20%	50V
C096	1-123-330-00	ELECT	22MF	20%	16V
C097	1-161-039-00	CERAMIC	0.001MF	10%	25V
C098	1-123-656-00	ELECT	1000MF	20%	10V

Ref.No.	Part No.	Description			Remark
C099	1-123-295-00	ELECT	100MF	20%	6.3V
C100	1-161-070-00	CERAMIC	0.01MF	20%	50V
C101	1-161-005-00	CERAMIC	0.0022MF	10%	25V
C102	1-123-307-00	ELECT	100MF	20%	10V
C103	1-161-070-00	CERAMIC	0.01MF	20%	50V
C104	1-161-021-00	CERAMIC	0.047MF	10%	25V
C105	1-123-356-00	ELECT	10MF	20%	16V
C106	1-123-330-00	ELECT	22MF	20%	16V
C107	1-123-330-00	ELECT	22MF	20%	16V
C108	1-123-381-00	ELECT	2.2MF	20%	50V
C109	1-123-381-00	ELECT	2.2MF	20%	50V
C110	1-123-332-00	ELECT	47MF	20%	16V
C111	1-123-295-00	ELECT	100MF	20%	6.3V
C112	1-161-070-00	CERAMIC	0.01MF	20%	50V
C113	1-123-296-00	ELECT	220MF	20%	6.3V
C114	1-102-820-00	CERAMIC	330PF	5%	50V
C115	1-102-980-00	CERAMIC	270PF	5%	50V
C116	1-101-059-00	CERAMIC	510PF	5%	50V
C117	1-102-980-00	CERAMIC	270PF	5%	50V
C118	1-123-306-00	ELECT	47MF	20%	10V
C119	1-123-332-00	ELECT	47MF	20%	16V
C120	1-161-013-00	CERAMIC	0.01MF	10%	25V
C121	1-123-307-00	ELECT	100MF	20%	10V
C122	1-102-962-00	CERAMIC	30PF	5%	50V
C123	1-161-021-00	CERAMIC	0.047MF	10%	25V
C124	1-102-960-00	CERAMIC	24PF	5%	50V
C125	1-161-013-00	CERAMIC	0.01MF	10%	25V
C126	1-161-072-00	CERAMIC	0.022MF	20%	50V
C127	1-161-013-00	CERAMIC	0.01MF	10%	25V
C128	1-161-021-00	CERAMIC	0.047MF	10%	25V
C129	1-161-021-00	CERAMIC	0.047MF	10%	25V
C132	1-102-980-00	CERAMIC	270PF	5%	50V
C133	1-123-306-00	ELECT	47MF	20%	10V
C134	1-102-823-00	CERAMIC	43PF	5%	50V
C135	1-102-823-00	CERAMIC	43PF	5%	50V
C136	1-102-824-00	CERAMIC	470PF	5%	50V
C137	1-161-021-00	CERAMIC	0.047MF	10%	25V
C138	1-102-976-00	CERAMIC	180PF	5%	50V
C139	1-102-976-00	CERAMIC	180PF	5%	50V
C140	1-101-059-00	CERAMIC	510PF	5%	50V
C141	1-102-972-00	CERAMIC	91PF	5%	50V
C142	1-102-966-00	CERAMIC	43PF	5%	50V
C143	1-102-816-00	CERAMIC	120PF	5%	50V
C144	1-123-356-00	ELECT	10MF	20%	16V
C145	1-102-112-00	CERAMIC	330PF	10%	50V
C146	1-123-380-00	ELECT	1MF	20%	50V
C147	1-102-976-00	CERAMIC	180PF	5%	50V
C148	1-102-980-00	CERAMIC	270PF	5%	50V
C149	1-101-880-00	CERAMIC	47PF	5%	50V
C150	1-102-820-00	CERAMIC	330PF	5%	50V
C151	1-123-306-00	ELECT	47MF	20%	10V
C152	1-124-145-00	ELECT	330MF	20%	16V
C153	1-101-361-00	CERAMIC	150PF	5%	50V

Ref.No.	Part No.	Description			Remark
C154	1-102-820-00	CERAMIC	330PF	5%	50V
C155	1-130-473-00	MYLAR	0.0015MF	5%	50V
C156	1-102-978-00	CERAMIC	220PF	5%	50V
C157	1-102-951-00	CERAMIC	15PF	5%	50V
C158	1-102-965-00	CERAMIC	39PF	5%	50V
C159	1-101-884-00	CERAMIC	56PF	5%	50V
C160	1-102-953-00	CERAMIC	18PF	5%	50V
C161	1-123-332-00	ELECT	47MF	20%	16V
C162	1-161-070-00	CERAMIC	0.01MF	20%	50V
C163	1-161-036-00	CERAMIC	0.047MF	20%	25V
C164	1-161-036-00	CERAMIC	0.047MF	20%	25V
C165	1-161-070-00	CERAMIC	0.01MF	20%	50V
C166	1-102-966-00	CERAMIC	43PF	5%	50V
C167	1-102-809-00	CERAMIC	7PF	1PF	50V
C168	1-102-112-00	CERAMIC	330PF	10%	50V
C169	1-161-013-00	CERAMIC	0.01MF	10%	25V
C170	1-161-013-00	CERAMIC	0.01MF	10%	25V
C171	1-102-934-00	CERAMIC	1PF	0.25PF	50V
C172	1-102-953-00	CERAMIC	18PF	5%	50V
C173	1-102-959-00	CERAMIC	22PF	5%	50V
C174	1-102-807-00	CERAMIC	5PF	1PF	50V
C175	1-123-296-00	ELECT	220MF	20%	6.3V
C176	1-123-380-00	ELECT	1MF	20%	50V
C177	1-102-973-00	CERAMIC	100PF	5%	50V
C178	1-123-307-00	ELECT	100MF	20%	10V
C179	1-161-006-00	CERAMIC	0.0027MF	10%	25V
C180	1-161-004-00	CERAMIC	0.0018MF	10%	25V
C181	1-123-296-00	ELECT	220MF	20%	6.3V
C182	1-123-356-00	ELECT	10MF	20%	16V
C183	1-161-013-00	CERAMIC	0.01MF	10%	25V
C184	1-161-013-00	CERAMIC	0.01MF	10%	25V
C185	1-161-013-00	CERAMIC	0.01MF	10%	25V
C186	1-161-013-00	CERAMIC	0.01MF	10%	25V
C187	1-102-816-00	CERAMIC	120PF	5%	50V
C188	1-123-356-00	ELECT	10MF	20%	16V
C189	1-161-070-00	CERAMIC	0.01MF	20%	50V
C190	1-123-332-00	ELECT	47MF	20%	16V
C191	1-161-072-00	CERAMIC	0.022MF	20%	50V
C192	1-123-332-00	ELECT	47MF	20%	16V
C193	1-161-070-00	CERAMIC	0.01MF	20%	50V
C194	1-102-529-00	CERAMIC	100PF	5%	50V
C195	1-161-036-00	CERAMIC	0.047MF	20%	25V
C196	1-161-036-00	CERAMIC	0.047MF	20%	25V
C197	1-161-036-00	CERAMIC	0.047MF	20%	25V
C198	1-161-070-00	CERAMIC	0.01MF	20%	50V
C199	1-102-963-00	CERAMIC	33PF	5%	50V
C200	1-102-959-00	CERAMIC	22PF	5%	50V
C201	1-123-305-00	ELECT	33MF	20%	10V
C202	1-161-021-00	CERAMIC	0.047MF	10%	25V
C203	1-161-021-00	CERAMIC	0.047MF	10%	25V
C204	1-161-021-00	CERAMIC	0.047MF	10%	25V
C205	1-161-021-00	CERAMIC	0.047MF	10%	25V
C206	1-123-330-00	ELECT	22MF	20%	16V

Ref.No.	Part No.	Description				Remark
C207	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C208	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C209	1-123-356-00	ELECT	10MF	20%	16V	
C210	1-101-884-00	CERAMIC	56PF	5%	50V	
C211	1-102-963-00	CERAMIC	33PF	5%	50V	
C212	1-102-851-00	CERAMIC	15PF	5%	50V	

FILTER

Ref.No.	Part No.	Description
CF001	1-527-823-00	FILTER, CERAMIC

CONNECTOR

Ref.No.	Part No.	Description
CN001●	:1-560-898-00	PIN, CONNECTOR 10P
CN002●	:1-560-894-00	PIN, CONNECTOR 6P
CN003●	:1-560-890-00	PIN, CONNECTOR 2P
CN004●	:1-560-890-00	PIN, CONNECTOR 2P
CN005●	:1-560-900-00	PIN, CONNECTOR 12P
CN006●	:1-560-890-00	PIN, CONNECTOR 2P

JACK

Ref.No.	Part No.	Description
CNJ001	1-507-892-00	JACK, PIN 1P
CNJ002	1-507-588-32	PIN JACK, 1P

DIODE

Ref.No.	Part No.	Description
D001	=>8-719-911-19	DIODE 1SS119
D002	=>8-719-911-19	DIODE 1SS119
D003	=>8-719-911-19	DIODE 1SS119
D004	=>8-719-911-19	DIODE 1SS119
D005	=>8-719-911-19	DIODE 1SS119
D006	=>8-719-911-19	DIODE 1SS119
D007	=>8-719-911-19	DIODE 1SS119
D008	=>8-719-911-19	DIODE 1SS119
D009	=>8-719-911-19	DIODE 1SS119
D010	=>8-719-911-19	DIODE 1SS119
D011	=>8-719-911-19	DIODE 1SS119
D012	=>8-719-911-19	DIODE 1SS119
D013	=>8-719-911-19	DIODE 1SS119
D014	=>8-719-911-19	DIODE 1SS119
D015	=>8-719-911-19	DIODE 1SS119
D016	=>8-719-911-19	DIODE 1SS119
D017	=>8-719-911-19	DIODE 1SS119
D018	=>8-719-911-19	DIODE 1SS119
D019	=>8-719-911-19	DIODE 1SS119
D020	=>8-719-911-19	DIODE 1SS119
D021	=>8-719-911-19	DIODE 1SS119
D022	=>8-719-911-19	DIODE 1SS119
D023	=>8-719-911-19	DIODE 1SS119
D024	=>8-719-911-19	DIODE 1SS119
D025	=>8-719-911-19	DIODE 1SS119

DELAY LINE

Ref.No.	Part No.	Description	Remark
DL001	1-415-283-00	DELAY LINE (1/2H)	
DL002	1-415-065-00	DELAY LINE	
DL003	1-415-159-00	DELAY LINE (1H)	

IC

Ref.No.	Part No.	Description
IC001	8-751-960-00	IC CX196
IC002	8-758-220-00	IC CX822
IC003	8-751-880-00	IC CX188
IC004	- - -	IC CX187
IC005	8-751-350-00	IC CX135

COIL

Ref.No.	Part No.	Description
L001	1-408-623-00	MICRO INDUCTOR 470UH
L002	1-408-614-00	MICRO INDUCTOR 82UH
L003	1-408-608-00	MICRO INDUCTOR 27UH
L004	1-408-600-00	MICRO INDUCTOR 5.6UH
L005	1-408-613-00	MICRO INDUCTOR 68UH
L006	1-408-619-00	MICRO INDUCTOR 220UH
L007	1-407-503-00	MICRO INDUCTOR 8.2MMH
L008	1-407-747-11	MICRO INDUCTOR 56UH
L009	1-408-611-00	MICRO INDUCTOR 47UH
L010	1-408-615-00	MICRO INDUCTOR 100UH
L011	1-408-616-00	MICRO INDUCTOR 120UH
L012	1-408-614-00	MICRO INDUCTOR 82UH
L013	1-408-617-00	MICRO INDUCTOR 150UH
L014	1-408-615-00	MICRO INDUCTOR 100UH
L015	1-408-613-00	MICRO INDUCTOR 68UH
L016	1-408-614-00	MICRO INDUCTOR 82UH
L017	1-407-718-00	MICRO INDUCTOR 1.2MMH
L018	1-408-608-00	MICRO INDUCTOR 27UH
L019	1-408-604-00	MICRO INDUCTOR 12UH
L020	1-408-602-00	MICRO INDUCTOR 8.2UH
L021	1-408-605-00	MICRO INDUCTOR 15UH
L022	1-408-603-00	MICRO INDUCTOR 10UH
L023	1-408-610-00	MICRO INDUCTOR 39UH
L024	1-408-610-00	MICRO INDUCTOR 39UH
L025	1-408-610-00	MICRO INDUCTOR 39UH
L026	1-408-616-00	MICRO INDUCTOR 120UH
L027	1-408-607-00	MICRO INDUCTOR 22UH
L028	1-408-614-00	MICRO INDUCTOR 82UH
L029	1-408-617-00	MICRO INDUCTOR 150UH
L030	1-408-618-00	MICRO INDUCTOR 180UH
L031	1-408-615-00	MICRO INDUCTOR 100UH
L032	1-408-602-00	MICRO INDUCTOR 8.2UH
L033	1-408-617-00	MICRO INDUCTOR 150UH
L034	1-408-617-00	MICRO INDUCTOR 150UH
L035	1-408-619-00	MICRO INDUCTOR 220UH
L036	1-408-618-00	MICRO INDUCTOR 180UH
L037	1-408-606-00	MICRO INDUCTOR 18UH
L038	1-408-606-00	MICRO INDUCTOR 18UH
L039	1-408-617-00	MICRO INDUCTOR 150UH
L040	1-408-401-00	MICRO INDUCTOR 2.2UH
L041	1-408-613-00	MICRO INDUCTOR 68UH
L042	1-408-619-00	MICRO INDUCTOR 220UH

YC-27

Ref.No.	Part No.	Description	Remark
		VARIABLE RESISTOR	
LV001	1-408-522-00	COIL, VARIABLE	
LV002	1-408-512-00	COIL (VARIABLE)	
		RF UNIT	
MD001⚠	1-464-266-00	RF UNIT, COLOR	
		TRANSISTOR	
Q001	8-729-245-83	TRANSISTOR 2SC2458	
Q002	8-729-245-83	TRANSISTOR 2SC2458	
Q003	8-729-245-83	TRANSISTOR 2SC2458	
Q004	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q005	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q006	8-729-245-83	TRANSISTOR 2SC2458	
Q007	8-729-178-54	TRANSISTOR 2SC2785	
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q009	=>8-729-178-54	TRANSISTOR 2SC2785	
Q010	8-729-245-83	TRANSISTOR 2SC2458	
Q011	8-729-245-83	TRANSISTOR 2SC2458	
Q012	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q013	8-729-245-83	TRANSISTOR 2SC2458	
Q014	8-729-245-83	TRANSISTOR 2SC2458	
Q015	8-729-245-83	TRANSISTOR 2SC2458	
Q016	8-729-178-55	TRANSISTOR 2SC2785-E	
Q017	8-729-245-83	TRANSISTOR 2SC2458	
Q018	8-729-245-83	TRANSISTOR 2SC2458	
Q019	8-729-245-83	TRANSISTOR 2SC2458	
Q020	8-729-245-83	TRANSISTOR 2SC2458	
Q021	8-729-245-83	TRANSISTOR 2SC2458	
Q022	8-729-178-54	TRANSISTOR 2SC2785	
Q023	8-729-178-54	TRANSISTOR 2SC2785	
Q024	8-729-245-83	TRANSISTOR 2SC2458	
Q025	8-729-245-83	TRANSISTOR 2SC2458	
Q026	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q027	8-729-384-48	TRANSISTOR 2SA844	
Q028	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q029	8-729-178-54	TRANSISTOR 2SC2785	
Q030	8-729-245-83	TRANSISTOR 2SC2458	
Q031	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q032	8-729-178-54	TRANSISTOR 2SC2785	
Q033	8-729-245-83	TRANSISTOR 2SC2458	
Q034	8-729-245-83	TRANSISTOR 2SC2458	
Q035	=>8-729-204-83	TRANSISTOR 2SA1048-GR	
Q036	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q037	8-729-173-37	TRANSISTOR 2SA733-P	
Q038	8-729-173-37	TRANSISTOR 2SA733-P	
Q039	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q040	8-729-173-37	TRANSISTOR 2SA733-P	
Q041	8-729-173-37	TRANSISTOR 2SA733-P	
Q042	8-729-173-37	TRANSISTOR 2SA733-P	
Q043	8-729-173-37	TRANSISTOR 2SA733-P	
Q044	8-729-245-83	TRANSISTOR 2SC2458	
Q045	8-729-173-37	TRANSISTOR 2SA733-P	
Q046	8-729-173-37	TRANSISTOR 2SA733-P	
Q047	8-729-173-37	TRANSISTOR 2SA733-P	
Q048	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q049	8-729-173-37	TRANSISTOR 2SA733-P	
Q050	8-729-173-37	TRANSISTOR 2SA733-P	
Q051	8-729-245-83	TRANSISTOR 2SC2458	
Q052	8-729-178-54	TRANSISTOR 2SC2785	
Q053	8-729-178-54	TRANSISTOR 2SC2785	
Q054	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q055	8-729-384-48	TRANSISTOR 2SA844	
Q056	=>8-729-603-50	TRANSISTOR 2SC403SP	
Q057	=>8-729-603-50	TRANSISTOR 2SC403SP	
		RESISTOR	
R001	1-247-869-00	CARBON 39K 5% 1/6W	
R002	1-247-855-00	CARBON 10K 5% 1/6W	
R003	1-246-461-00	CARBON 330 5% 1/4W	
R004	1-247-849-00	CARBON 5.6K 5% 1/6W	
R005	1-247-809-00	CARBON 120 5% 1/6W	
R006	1-247-847-00	CARBON 4.7K 5% 1/6W	
R007	1-247-848-00	CARBON 5.1K 5% 1/6W	
R008	1-247-881-00	CARBON 120K 5% 1/6W	
R009	1-247-836-00	CARBON 1.6K 5% 1/6W	
R010	1-247-841-00	CARBON 2.7K 5% 1/6W	
R011	1-247-827-00	CARBON 680 5% 1/6W	
R012	1-247-863-00	CARBON 22K 5% 1/6W	
R013	1-247-838-00	CARBON 2K 5% 1/6W	
R014	1-247-871-00	CARBON 47K 5% 1/6W	
R015	1-247-833-00	CARBON 1.2K 5% 1/6W	
R016	1-247-889-00	CARBON 270K 5% 1/6W	
R017	1-247-879-00	CARBON 100K 5% 1/6W	
R018	1-247-859-00	CARBON 15K 5% 1/6W	
R019	1-247-881-00	CARBON 120K 5% 1/6W	
R020	1-247-825-00	CARBON 560 5% 1/6W	
R021	1-247-859-00	CARBON 15K 5% 1/6W	
R022	1-247-856-00	CARBON 11K 5% 1/6W	
R023	1-247-855-00	CARBON 10K 5% 1/6W	
R024	1-247-837-00	CARBON 1.8K 5% 1/6W	
R025	1-247-855-00	CARBON 10K 5% 1/6W	
R026	1-247-807-00	CARBON 100 5% 1/6W	
R027	1-247-871-00	CARBON 47K 5% 1/6W	
R028	1-247-871-00	CARBON 47K 5% 1/6W	
R029	1-247-884-00	CARBON 160K 5% 1/6W	
R030	1-247-831-00	CARBON 1K 5% 1/6W	
R031	1-247-853-00	CARBON 8.2K 5% 1/6W	
R032	1-247-819-00	CARBON 330 5% 1/6W	
R033	1-247-819-00	CARBON 330 5% 1/6W	
R034	1-247-853-00	CARBON 8.2K 5% 1/6W	
R035	1-247-853-00	CARBON 8.2K 5% 1/6W	
R036	1-247-884-00	CARBON 160K 5% 1/6W	
R037	1-247-843-00	CARBON 3.3K 5% 1/6W	
R038	1-247-903-00	CARBON 1M 5% 1/6W	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark
R039	1-247-855-00	CARBON	10K	5%	1/6W	
R040	1-247-855-00	CARBON	10K	5%	1/6W	
R041	1-247-872-00	CARBON	51K	5%	1/6W	
R042	1-247-855-00	CARBON	10K	5%	1/6W	
R043	1-247-869-00	CARBON	39K	5%	1/6W	
R044	1-247-824-00	CARBON	510	5%	1/6W	
R045	1-247-855-00	CARBON	10K	5%	1/6W	
R046	1-247-872-00	CARBON	51K	5%	1/6W	
R047	1-247-851-00	CARBON	6.8K	5%	1/6W	
R048	1-247-859-00	CARBON	15K	5%	1/6W	
R050	1-247-873-00	CARBON	56K	5%	1/6W	
R051	1-247-868-00	CARBON	36K	5%	1/6W	
R052	1-247-863-00	CARBON	22K	5%	1/6W	
R053	1-247-865-00	CARBON	27K	5%	1/6W	
R054	1-247-839-00	CARBON	2.2K	5%	1/6W	
R055	1-247-825-00	CARBON	560	5%	1/6W	
R056	1-247-799-00	CARBON	47	5%	1/6W	
R057	1-247-831-00	CARBON	1K	5%	1/6W	
R058	1-247-825-00	CARBON	560	5%	1/6W	
R059	1-247-831-00	CARBON	1K	5%	1/6W	
R060	1-247-825-00	CARBON	560	5%	1/6W	
R061	1-247-825-00	CARBON	560	5%	1/6W	
R062	1-247-839-00	CARBON	2.2K	5%	1/6W	
R063	1-247-879-00	CARBON	100K	5%	1/6W	
R064	1-247-843-00	CARBON	3.3K	5%	1/6W	
R065	1-247-900-00	CARBON	750K	5%	1/6W	
R066	1-210-819-00	SOLID	1.8M	5%	1/4W	
R067	1-247-843-00	CARBON	3.3K	5%	1/6W	
R068	1-247-839-00	CARBON	2.2K	5%	1/6W	
R069	1-247-851-00	CARBON	6.8K	5%	1/6W	
R070	1-247-842-00	CARBON	3K	5%	1/6W	
R071	1-247-855-00	CARBON	10K	5%	1/6W	
R072	1-247-871-00	CARBON	47K	5%	1/6W	
R073	1-247-849-00	CARBON	5.6K	5%	1/6W	
R074	1-247-855-00	CARBON	10K	5%	1/6W	
R075	1-247-835-00	CARBON	1.5K	5%	1/6W	
R076	1-247-848-00	CARBON	5.1K	5%	1/6W	
R077	1-247-835-00	CARBON	1.5K	5%	1/6W	
R078	1-247-837-00	CARBON	1.8K	5%	1/6W	
R079	1-247-855-00	CARBON	10K	5%	1/6W	
R080	1-247-849-00	CARBON	5.6K	5%	1/6W	
R081	1-247-852-00	CARBON	7.5K	5%	1/6W	
R082	1-247-873-00	CARBON	56K	5%	1/6W	
R083	1-247-829-00	CARBON	820	5%	1/6W	
R084	1-247-831-00	CARBON	1K	5%	1/6W	
R085	1-247-829-00	CARBON	820	5%	1/6W	
R086	1-247-833-00	CARBON	1.2K	5%	1/6W	
R087	1-247-831-00	CARBON	1K	5%	1/6W	
R088	1-247-846-00	CARBON	4.3K	5%	1/6W	
R089	1-247-855-00	CARBON	10K	5%	1/6W	
R090	1-247-831-00	CARBON	1K	5%	1/6W	
R091	1-247-831-00	CARBON	1K	5%	1/6W	
R092	1-247-813-00	CARBON	180	5%	1/6W	
R093	1-247-809-00	CARBON	120	5%	1/6W	
R094	1-247-831-00	CARBON	1K	5%	1/6W	
R095	1-247-855-00	CARBON	10K	5%	1/6W	
R096	1-247-855-00	CARBON	10K	5%	1/6W	
R097	1-247-847-00	CARBON	4.7K	5%	1/6W	
R098	1-247-847-00	CARBON	4.7K	5%	1/6W	
R099	1-247-855-00	CARBON	10K	5%	1/6W	
R100	1-247-871-00	CARBON	47K	5%	1/6W	
R101	1-247-859-00	CARBON	15K	5%	1/6W	
R102	1-247-867-00	CARBON	33K	5%	1/6W	
R103	1-244-860-51	CARBON	300	5%	1/2W	
R104	1-247-803-00	CARBON	68	5%	1/6W	
R105	1-247-829-00	CARBON	820	5%	1/6W	
R106	1-247-831-00	CARBON	1K	5%	1/6W	
R107	1-247-849-00	CARBON	5.6K	5%	1/6W	
R108	1-247-827-00	CARBON	680	5%	1/6W	
R109	1-247-855-00	CARBON	10K	5%	1/6W	
R110	1-247-871-00	CARBON	47K	5%	1/6W	
R111	1-247-853-00	CARBON	8.2K	5%	1/6W	
R112	1-247-839-00	CARBON	2.2K	5%	1/6W	
R113	1-247-867-00	CARBON	33K	5%	1/6W	
R114	1-247-855-00	CARBON	10K	5%	1/6W	
R115	1-247-855-00	CARBON	10K	5%	1/6W	
R116	1-247-871-00	CARBON	47K	5%	1/6W	
R117	1-247-871-00	CARBON	47K	5%	1/6W	
R118	1-247-854-00	CARBON	9.1K	5%	1/6W	
R119	1-247-859-00	CARBON	15K	5%	1/6W	
R120	1-247-853-00	CARBON	8.2K	5%	1/6W	
R121	1-247-827-00	CARBON	680	5%	1/6W	
R122	1-247-847-00	CARBON	4.7K	5%	1/6W	
R123	1-247-838-00	CARBON	2K	5%	1/6W	
R124	1-247-846-00	CARBON	4.3K	5%	1/6W	
R125	1-247-807-00	CARBON	100	5%	1/6W	
R126	1-247-827-00	CARBON	680	5%	1/6W	
R127	1-247-827-00	CARBON	680	5%	1/6W	
R128	1-247-827-00	CARBON	680	5%	1/6W	
R129	1-247-827-00	CARBON	680	5%	1/6W	
R130	1-247-821-00	CARBON	390	5%	1/6W	
R131	1-247-839-00	CARBON	2.2K	5%	1/6W	
R132	1-247-809-00	CARBON	120	5%	1/6W	
R133	1-247-827-00	CARBON	680	5%	1/6W	
R134	1-247-865-00	CARBON	27K	5%	1/6W	
R135	1-247-831-00	CARBON	1K	5%	1/6W	
R136	1-247-823-00	CARBON	470	5%	1/6W	
R137	1-247-823-00	CARBON	470	5%	1/6W	
R138	1-247-833-00	CARBON	1.2K	5%	1/6W	
R139	1-247-831-00	CARBON	1K	5%	1/6W	
R140	1-247-833-00	CARBON	1.2K	5%	1/6W	
R141	1-247-839-00	CARBON	2.2K	5%	1/6W	
R142	1-247-831-00	CARBON	1K	5%	1/6W	
R143	1-247-863-00	CARBON	22K	5%	1/6W	
R144	1-247-859-00	CARBON	15K	5%	1/6W	
R145	1-247-831-00	CARBON	1K	5%	1/6W	

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Ref.No.	Part No.	Description				Remark	Ref.No.	Part No.	Description				Remark
R146	1-247-855-00	CARBON	10K	5%	1/6W		R199	1-247-835-00	CARBON	1.5K	5%	1/6W	
R147	1-247-863-00	CARBON	22K	5%	1/6W		R200	1-247-826-00	CARBON	620	5%	1/6W	
R148	1-247-828-00	CARBON	750	5%	1/6W		R201	1-247-831-00	CARBON	1K	5%	1/6W	
R149	1-247-840-00	CARBON	2.4K	5%	1/6W		R202	1-247-837-00	CARBON	1.8K	5%	1/6W	
R150	1-247-847-00	CARBON	4.7K	5%	1/6W		R203	1-247-819-00	CARBON	330	5%	1/6W	
R151	1-247-855-00	CARBON	10K	5%	1/6W		R204	1-247-839-00	CARBON	2.2K	5%	1/6W	
R152	1-247-863-00	CARBON	22K	5%	1/6W		R205	1-247-853-00	CARBON	8.2K	5%	1/6W	
R153	1-247-828-00	CARBON	750	5%	1/6W		R206	1-247-857-00	CARBON	12K	5%	1/6W	
R154	1-247-867-00	CARBON	33K	5%	1/6W		R207	1-247-831-00	CARBON	1K	5%	1/6W	
R155	1-247-839-00	CARBON	2.2K	5%	1/6W		R208	1-247-823-00	CARBON	470	5%	1/6W	
R156	1-247-861-00	CARBON	18K	5%	1/6W		R209	1-247-815-00	CARBON	220	5%	1/6W	
R157	1-247-863-00	CARBON	22K	5%	1/6W		R210	1-247-820-00	CARBON	360	5%	1/6W	
R158	1-247-831-00	CARBON	1K	5%	1/6W		R211	1-247-783-00	CARBON	10	5%	1/6W	
R159	1-247-837-00	CARBON	1.8K	5%	1/6W		R212	1-247-835-00	CARBON	1.5K	5%	1/6W	
R160	1-247-849-00	CARBON	5.6K	5%	1/6W		R213	1-247-832-00	CARBON	1.1K	5%	1/6W	
R161	1-247-851-00	CARBON	6.8K	5%	1/6W		R214	1-247-861-00	CARBON	18K	5%	1/6W	
R162	1-247-851-00	CARBON	6.8K	5%	1/6W		R215	1-247-845-00	CARBON	3.9K	5%	1/6W	
R163	1-247-859-00	CARBON	15K	5%	1/6W		R216	1-247-831-00	CARBON	1K	5%	1/6W	
R164	1-247-825-00	CARBON	560	5%	1/6W		R217	1-247-839-00	CARBON	2.2K	5%	1/6W	
R165	1-247-831-00	CARBON	1K	5%	1/6W		R218	1-247-822-00	CARBON	430	5%	1/6W	
R166	1-247-824-00	CARBON	510	5%	1/6W		R219	1-247-842-00	CARBON	3K	5%	1/6W	
R167	1-247-856-00	CARBON	11K	5%	1/6W		R220	1-247-829-00	CARBON	820	5%	1/6W	
R168	1-247-813-00	CARBON	180	5%	1/6W		R221	1-247-825-00	CARBON	560	5%	1/6W	
R169	1-247-813-00	CARBON	180	5%	1/6W		R222	1-247-817-00	CARBON	270	5%	1/6W	
R170	1-247-856-00	CARBON	11K	5%	1/6W		R223	1-247-807-00	CARBON	100	5%	1/6W	
R171	1-247-831-00	CARBON	1K	5%	1/6W		R224	1-247-825-00	CARBON	560	5%	1/6W	
R172	1-247-823-00	CARBON	470	5%	1/6W		R225	1-247-823-00	CARBON	470	5%	1/6W	
R173	1-247-811-00	CARBON	150	5%	1/6W		R226	1-247-863-00	CARBON	22K	5%	1/6W	
R174	1-247-837-00	CARBON	1.8K	5%	1/6W		R227	1-247-799-00	CARBON	47	5%	1/6W	
R175	1-247-839-00	CARBON	2.2K	5%	1/6W		R228	1-247-855-00	CARBON	10K	5%	1/6W	
R176	1-247-817-00	CARBON	270	5%	1/6W		R229	1-247-807-00	CARBON	100	5%	1/6W	
R177	1-247-847-00	CARBON	4.7K	5%	1/6W		R230	1-247-823-00	CARBON	470	5%	1/6W	
R178	1-247-835-00	CARBON	1.5K	5%	1/6W		R231	1-247-824-00	CARBON	510	5%	1/6W	
R179	1-247-842-00	CARBON	3K	5%	1/6W		R232	1-247-823-00	CARBON	470	5%	1/6W	
R180	1-247-819-00	CARBON	330	5%	1/6W		R233	1-247-823-00	CARBON	470	5%	1/6W	
R181	1-247-859-00	CARBON	15K	5%	1/6W		R234	1-247-837-00	CARBON	1.8K	5%	1/6W	
R182	1-247-832-00	CARBON	1.1K	5%	1/6W		R235	1-247-833-00	CARBON	1.2K	5%	1/6W	
R183	1-247-821-00	CARBON	390	5%	1/6W		R236	1-247-831-00	CARBON	1K	5%	1/6W	
R184	1-247-835-00	CARBON	1.5K	5%	1/6W		R237	1-247-843-00	CARBON	3.3K	5%	1/6W	
R185	1-247-831-00	CARBON	1K	5%	1/6W		R238	1-247-833-00	CARBON	1.2K	5%	1/6W	
R186	1-247-847-00	CARBON	4.7K	5%	1/6W		R239	1-247-831-00	CARBON	1K	5%	1/6W	
R187	1-247-799-00	CARBON	47	5%	1/6W		R240	1-247-854-00	CARBON	9.1K	5%	1/6W	
R188	1-247-869-00	CARBON	39K	5%	1/6W		R241	1-247-858-00	CARBON	13K	5%	1/6W	
R189	1-247-827-00	CARBON	680	5%	1/6W		R242	1-247-863-00	CARBON	22K	5%	1/6W	
R190	1-247-871-00	CARBON	47K	5%	1/6W		R243	1-247-879-00	CARBON	100K	5%	1/6W	
R191	1-247-865-00	CARBON	27K	5%	1/6W		R244	1-247-831-00	CARBON	1K	5%	1/6W	
R192	1-247-851-00	CARBON	6.8K	5%	1/6W		R245	1-247-827-00	CARBON	680	5%	1/6W	
R193	1-247-857-00	CARBON	12K	5%	1/6W		R246	1-247-799-00	CARBON	47	5%	1/6W	
R194	1-247-820-00	CARBON	360	5%	1/6W		R247	1-247-857-00	CARBON	12K	5%	1/6W	
R195	1-247-815-00	CARBON	220	5%	1/6W		R248	1-247-847-00	CARBON	4.7K	5%	1/6W	
R196	1-247-839-00	CARBON	2.2K	5%	1/6W		R249	1-247-823-00	CARBON	470	5%	1/6W	
R197	1-247-831-00	CARBON	1K	5%	1/6W		R250	1-247-839-00	CARBON	2.2K	5%	1/6W	
R198	1-247-866-00	CARBON	30K	5%	1/6W		R251	1-247-817-00	CARBON	270	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R252	1-247-807-00	CARBON	100	5%	1/6W	
R253	1-247-817-00	CARBON	270	5%	1/6W	
R254	1-247-825-00	CARBON	560	5%	1/6W	
R255	1-247-838-00	CARBON	2K	5%	1/6W	
R256	1-247-849-00	CARBON	5.6K	5%	1/6W	
R257	1-247-845-00	CARBON	3.9K	5%	1/6W	
R258	1-247-843-00	CARBON	3.3K	5%	1/6W	
R259	1-247-835-00	CARBON	1.5K	5%	1/6W	
R260	1-247-859-00	CARBON	15K	5%	1/6W	
R261	1-247-861-00	CARBON	18K	5%	1/6W	
R262	1-247-811-00	CARBON	150	5%	1/6W	
R263	1-247-807-00	CARBON	100	5%	1/6W	
R264	1-246-465-00	CARBON	470	5%	1/4W	
R265	1-247-799-00	CARBON	47	5%	1/6W	
R266	1-247-843-00	CARBON	3.3K	5%	1/6W	
R267	1-247-804-00	CARBON	75	5%	1/6W	
R268	1-247-855-00	CARBON	10K	5%	1/6W	
R269	1-247-828-00	CARBON	750	5%	1/6W	
R270	1-247-859-00	CARBON	15K	5%	1/6W	
R271	1-247-847-00	CARBON	4.7K	5%	1/6W	
R272	1-247-815-00	CARBON	220	5%	1/6W	
R273	1-247-852-00	CARBON	7.5K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-747-00	RES, ADJ, CARBON 4.7K
RV002	1-228-746-00	RES, ADJ, CARBON 2.2K
RV003	1-228-748-00	RES, ADJ, CARBON 10K
RV004	1-228-750-00	RES, ADJ, CARBON 47K
RV005	1-228-746-00	RES, ADJ, CARBON 2.2K
RV006	1-228-744-00	RES, ADJ, CARBON 470
RV007	1-228-749-00	RES, ADJ, CARBON 22K
RV008	1-228-745-00	RES, ADJ, CARBON 1K
RV009	1-228-746-00	RES, ADJ, CARBON 2.2K
RV010	1-228-744-00	RES, ADJ, CARBON 470
RV011	1-228-748-00	RES, ADJ, CARBON 10K
RV012	1-228-746-00	RES, ADJ, CARBON 2.2K
RV013	1-228-745-00	RES, ADJ, CARBON 1K
RV014	1-228-745-00	RES, ADJ, CARBON 1K
RV015	1-228-745-00	RES, ADJ, CARBON 1K
RV016	1-228-744-00	RES, ADJ, CARBON 470
RV017	1-228-744-00	RES, ADJ, CARBON 470
RV018	1-228-750-00	RES, ADJ, CARBON 47K
RV019	1-228-745-00	RES, ADJ, CARBON 1K

SWITCH

S001	1-553-725-21	SWITCH, SLIDE

TRANSFORMER

T001	1-426-083-00	TRANSFORMER, BAND PASS
T002	1-426-082-00	TRANSFORMER, BAND PASS
T003	1-426-081-00	TRANSFORMER, BAND PASS
T004	1-426-078-00	TRANSFORME, VAST AMP
T005	1-426-076-00	TRANSFORMER, EQUALIZER (1)
T006	1-426-080-00	TRANSFORMER, BAND PASS
T007	1-426-079-00	TRANSFORMER, BAND PASS
T008	1-426-077-00	TRANSFORMER, EQUALIZER (2)

CRYSTAL

X001	1-527-396-00	CRYSTAL, OSC
X002	1-567-126-00	VIBRATOR, CRYSTAL

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♠:1-606-794-00 N BOARD
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CAPACITOR

C001	1-123-617-00	ELECT	10MF	20%	16V
C002	1-123-617-00	ELECT	10MF	20%	16V
C003	1-123-617-00	ELECT	10MF	20%	16V
C004	1-161-019-00	CERAMIC	0.033MF	10%	25V
C005	1-108-567-00	MYLAR	0.0033MF	5%	50V
C006	1-123-821-00	ELECT	47MF	20%	16V

DIODE

D001	8-719-110-32	DIODE PH302B

IC

IC001	8-759-113-73	IC UPC1373H

COIL

L001	1-404-310-00	COIL

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CS-3 BOARD
****

CONNECTOR

CN301	♠:1-564-029-00	PIN, CONNECTOR 4P

SWITCH

S301	1-554-241-00	SWITCH, LEVER

****

CS-4 BOARD
****

SWITCH

S302	1-554-241-00	SWITCH, LEVER

LM-8 RD-5 RP-8

Ref.No.	Part No.	Description				Remark
	●:1-605-071-00	LM-8 BOARD **********				

CAPACITOR

Ref.No.	Part No.	Description				Remark
C101	1-161-057-00	CERAMIC	0.033MF	10%	50V	
C102	1-161-057-00	CERAMIC	0.033MF	10%	50V	

COIL

Ref.No.	Part No.	Description				Remark
L101	1-408-120-00	MICRO INDUCTOR 18UH				
L102	1-408-120-00	MICRO INDUCTOR 18UH				

RESISTOR

Ref.No.	Part No.	Description				Remark
R101	⚠1-206-479-00	METAL OXIDE	47	5%	2W	F

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Ref.No.	Part No.	Description				Remark
	●:1-609-231-00	RD-5 BOARD **********				

DIODE

Ref.No.	Part No.	Description				Remark
D001	8-719-921-03	DIODE GP-2S02B				

RESISTOR

Ref.No.	Part No.	Description				Remark
R001	1-247-887-00	CARBON	220K	5%	1/6W	
R002	1-247-831-00	CARBON	1K	5%	1/6W	

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Ref.No.	Part No.	Description				Remark
	●:A-6728-710-A	RP-8 BOARD, COMPLETE ********************				
	●:3-679-178-00	CASE (INNER), SHIELD, RP-66				
	●:3-679-179-00	CASE (LOWER), SHIELD, RP-66				
	●:3-679-240-00	CASE (UPPER), SHIELD, RP-55				
	●:3-682-665-00	CASE (MAIN), SHIELD, RP-55				

CAPACITOR

Ref.No.	Part No.	Description				Remark
C001	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C002	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C003	1-123-380-00	ELECT	1MF	20%	50V	
C004	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C005	1-123-380-00	ELECT	1MF	20%	50V	
C006	1-123-381-00	ELECT	2.2MF	20%	50V	
C007	1-161-009-00	CERAMIC	0.0047MF	10%	25V	
C008	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C009	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C010	1-101-886-00	CERAMIC	62PF	5%	50V	
C011	1-101-886-00	CERAMIC	62PF	5%	50V	
C012	1-161-017-00	CERAMIC	0.022MF	10%	25V	
C013	1-123-356-00	ELECT	10MF	20%	16V	
C014	1-102-114-00	CERAMIC	470PF	10%	50V	
C015	1-102-973-00	CERAMIC	100PF	5%	50V	
C016	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C018	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C019	1-161-017-00	CERAMIC	0.022MF	10%	25V	
C020	1-161-017-00	CERAMIC	0.022MF	10%	25V	
C021	1-102-112-00	CERAMIC	330PF	10%	50V	
C022	1-131-371-00	TANTALUM	10MF	20%	16V	
C025	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C026	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C027	1-123-330-00	ELECT	22MF	20%	16V	
C028	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C029	1-123-330-00	ELECT	22MF	20%	16V	
C030	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C031	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C032	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C033	1-123-330-00	ELECT	22MF	20%	16V	
C034	1-123-305-00	ELECT	33MF	20%	10V	
C035	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C037	1-102-958-00	CERAMIC	20PF	5%	50V	
C038	1-102-960-00	CERAMIC	24PF	5%	50V	

CONNECTOR

Ref.No.	Part No.	Description				Remark
CN001	●:1-508-845-00	PIN, CONNECTOR 6P				
CN002	●:1-508-845-00	PIN, CONNECTOR 6P				
CN003	●:1-564-030-00	PIN, CONNECTOR 5P				
CN004	●:1-508-744-00	PIN, CONNECTOR 10P				
CN005	●:1-564-028-00	PIN, CONNECTOR 3P				

DIODE

Ref.No.	Part No.	Description				Remark
D001	=>8-719-911-19	DIODE 1SS119				

IC

Ref.No.	Part No.	Description				Remark
IC001	8-758-620-00	IC CX862				
IC002	8-759-601-34	IC CX134A				

COIL

Ref.No.	Part No.	Description				Remark
L001	1-408-877-00	MICRO INDUCTOR 0.22UH				
L002	1-408-877-00	MICRO INDUCTOR 0.22UH				
L003	1-408-604-00	MICRO INDUCTOR 12UH				
L004	1-408-158-00	MICRO INDUCTOR 6.8MMH				
L005	1-408-158-00	MICRO INDUCTOR 6.8MMH				
L006	1-408-604-00	MICRO INDUCTOR 12UH				
L007	1-408-616-00	MICRO INDUCTOR 120UH				
L008	1-407-717-00	MICRO INDUCTOR 1MMH				
L009	1-408-622-00	MICRO INDUCTOR 390UH				
L010	1-408-622-00	MICRO INDUCTOR 390UH				
L011	1-408-615-00	MICRO INDUCTOR 100UH				

TRANSISTOR

Ref.No.	Part No.	Description				Remark
Q001	=>8-729-204-83	TRANSISTOR 2SA1048-GR				
Q002	8-729-178-54	TRANSISTOR 2SC2785				
Q003	8-729-178-54	TRANSISTOR 2SC2785				
Q004	8-729-178-54	TRANSISTOR 2SC2785				
Q005	8-729-606-32	TRANSISTOR 2SC2603				
Q006	8-729-178-54	TRANSISTOR 2SC2785				

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark

RESISTOR

Ref.No.	Part No.	Description				Remark
R001	1-247-852-00	CARBON	7.5K	5%	1/6W	
R002	1-247-855-00	CARBON	10K	5%	1/6W	
R003	1-247-844-00	CARBON	3.6K	5%	1/6W	
R004	1-247-867-00	CARBON	33K	5%	1/6W	
R006	1-247-831-00	CARBON	1K	5%	1/6W	
R007	1-247-831-00	CARBON	1K	5%	1/6W	
R008	1-247-822-00	CARBON	430	5%	1/6W	
R009	1-247-779-00	CARBON	6.8	5%	1/6W	
R010	1-247-815-00	CARBON	220	5%	1/6W	
R011	⚠ 1-247-028-00	CARBON	8.2	5%	1/8W	F
R012	1-247-839-00	CARBON	2.2K	5%	1/6W	
R013	1-247-839-00	CARBON	2.2K	5%	1/6W	
R014	1-247-839-00	CARBON	2.2K	5%	1/6W	
R015	1-247-839-00	CARBON	2.2K	5%	1/6W	
R016	1-247-831-00	CARBON	1K	5%	1/6W	
R017	1-247-831-00	CARBON	1K	5%	1/6W	
R018	1-247-849-00	CARBON	5.6K	5%	1/6W	
R019	1-247-833-00	CARBON	1.2K	5%	1/6W	
R020	1-247-825-00	CARBON	560	5%	1/6W	
R021	1-247-855-00	CARBON	10K	5%	1/6W	
R022	1-247-831-00	CARBON	1K	5%	1/6W	
R024	1-247-826-00	CARBON	620	5%	1/6W	
R025	1-247-839-00	CARBON	2.2K	5%	1/6W	
R026	1-247-809-00	CARBON	120	5%	1/6W	
R027	1-247-847-00	CARBON	4.7K	5%	1/6W	
R028	1-247-867-00	CARBON	33K	5%	1/6W	
R029	⚠ 1-247-028-00	CARBON	8.2	5%	1/8W	F
R030	1-247-831-00	CARBON	1K	5%	1/6W	
R031	1-247-821-00	CARBON	390	5%	1/6W	
R032	1-247-834-00	CARBON	1.3K	5%	1/6W	
R033	1-247-834-00	CARBON	1.3K	5%	1/6W	
R034	1-247-821-00	CARBON	390	5%	1/6W	
R035	1-247-844-00	CARBON	3.6K	5%	1/6W	
R036	1-247-844-00	CARBON	3.6K	5%	1/6W	
R037	1-247-807-00	CARBON	100	5%	1/6W	
R038	1-247-828-00	CARBON	750	5%	1/6W	
R039	1-247-817-00	CARBON	270	5%	1/6W	
R040	1-247-833-00	CARBON	1.2K	5%	1/6W	
R041	1-247-818-00	CARBON	300	5%	1/6W	
R042	1-247-783-00	CARBON	10	5%	1/6W	
R043	1-247-818-00	CARBON	300	5%	1/6W	
R044	1-247-783-00	CARBON	10	5%	1/6W	
R045	1-247-863-00	CARBON	22K	5%	1/6W	
R046	1-247-855-00	CARBON	10K	5%	1/6W	
R047	1-247-844-00	CARBON	3.6K	5%	1/6W	
R048	1-247-855-00	CARBON	10K	5%	1/6W	
R049	1-247-845-00	CARBON	3.9K	5%	1/6W	

VARIABLE RESISTOR

Ref.No.	Part No.	Description	Remark
RV001	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV002	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV003	1-228-919-00	RES, ADJ, CARBON 1K	
RV004	1-228-919-00	RES, ADJ, CARBON 1K	
RV005	1-228-921-00	RES, ADJ, CARBON 4.7K	
RV006	1-228-747-00	RES, ADJ, CARBON 4.7K	

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♠:1-610-596-00 FS-29 BOARD
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VARIABLE RESISTOR

Ref.No.	Part No.	Description
RV001	1-228-918-00	RES, VAR, CARBON 100K

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♠:1-610-597-00 FS-28 BOARD
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3-681-943-00 HOLDER, 6 GANG

DIODE

Ref.No.	Part No.	Description
D201	8-719-812-33	DIODE TLG123A
D202	8-719-812-33	DIODE TLG123A
D203	8-719-812-33	DIODE TLG123A
D204	8-719-812-33	DIODE TLG123A
D205	8-719-812-33	DIODE TLG123A
D206	8-719-812-33	DIODE TLG123A
D207	8-719-812-33	DIODE TLG123A

RESISTOR

Ref.No.	Part No.	Description			
R201	1-247-863-00	CARBON	22K	5%	1/6W
R202	1-247-863-00	CARBON	22K	5%	1/6W

VARIABLE RESISTOR

Ref.No.	Part No.	Description
RV201	1-230-066-00	RES, ADJ, CARBON 4.7K

SWITCH

Ref.No.	Part No.	Description
S201	1-553-997-00	SWITCH, KEY BOARD
S202	1-553-997-00	SWITCH, KEY BOARD
S203	1-553-716-00	SWITCH, SLIDE
S204	1-553-754-00	SWITCH, SLIDE

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♠:1-610-598-00 FS-33 BOARD
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DIODE

Ref.No.	Part No.	Description
D301	8-719-812-31	DIODE TLR123
D302	8-719-812-32	DIODE TLY123

SWITCH

Ref.No.	Part No.	Description
S301	1-553-997-00	SWITCH, KEY BOARD
S302	1-553-997-00	SWITCH, KEY BOARD

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TS-30 TS-31

Ref.No.	Part No.	Description	Remark
	♠:A-6728-810-A	TS-30 BOARD, COMPLETE *********************	

CAPACITOR

Ref.No.	Part No.	Description	Remark
C001	1-123-354-00	ELECT 3.3MF 20% 50V	
C002	1-123-351-00	ELECT 0.47MF 20% 50V	
C003	1-102-508-00	CERAMIC 10PF 0.5PF 50V	
C004	1-102-508-00	CERAMIC 10PF 0.5PF 50V	
C005	1-161-023-00	CERAMIC 0.068MF 10% 25V	
C006	1-161-494-00	CERAMIC 0.022MF 30% 25V	

DIODE

Ref.No.	Part No.	Description	Remark
D001	8-719-101-74	DIODE RD9.1E-L3	
D002	8-719-812-31	DIODE TLR123	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	=>8-719-100-35	DIODE RD5.6E-B2	
D101	8-719-104-45	DIODE SG213T	
D102	8-719-104-45	DIODE SG213T	
D103	8-719-104-45	DIODE SG213T	
D104	8-719-104-45	DIODE SG213T	
D105	8-719-104-45	DIODE SG213T	
D106	8-719-104-45	DIODE SG213T	
D107	8-719-104-45	DIODE SG213T	
D108	8-719-104-45	DIODE SG213T	
D109	8-719-104-45	DIODE SG213T	
D110	8-719-104-45	DIODE SG213T	
D111	8-719-104-45	DIODE SG213T	
D112	8-719-104-45	DIODE SG213T	
D113	8-719-104-45	DIODE SG213T	
D114	8-719-104-45	DIODE SG213T	
D115	8-719-911-19	DIODE 1SS119	
D116	8-719-911-19	DIODE 1SS119	
D117	8-719-911-19	DIODE 1SS119	
D118	8-719-911-19	DIODE 1SS119	
D119	8-719-911-19	DIODE 1SS119	

IC

Ref.No.	Part No.	Description	Remark
IC001	8-759-101-75	IC UPD7519G-547	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q001	=>8-729-204-83	TRANSISTOR 2SA1048-GR	
Q002	=>8-729-245-83	TRANSISTOR 2SC2458	
Q003	=>8-729-245-83	TRANSISTOR 2SC2458	

RESISTOR

Ref.No.	Part No.	Description	Remark
R001	1-247-875-00	CARBON 68K 5% 1/6W	
R002	1-247-867-00	CARBON 33K 5% 1/6W	
R003	1-247-903-00	CARBON 1M 5% 1/6W	
R004	1-247-867-00	CARBON 33K 5% 1/6W	
R005	1-247-879-00	CARBON 100K 5% 1/6W	
R006	1-247-869-00	CARBON 39K 5% 1/6W	
R007	1-247-872-00	CARBON 51K 5% 1/6W	
R008	1-247-874-00	CARBON 62K 5% 1/6W	
R009	1-247-863-00	CARBON 22K 5% 1/6W	
R010	1-247-867-00	CARBON 33K 5% 1/6W	
R011	1-247-859-00	CARBON 15K 5% 1/6W	
R012	1-247-863-00	CARBON 22K 5% 1/6W	
R013	1-247-863-00	CARBON 22K 5% 1/6W	
R014	1-247-863-00	CARBON 22K 5% 1/6W	
R015	1-247-863-00	CARBON 22K 5% 1/6W	
R016	1-247-863-00	CARBON 22K 5% 1/6W	
R017	1-247-863-00	CARBON 22K 5% 1/6W	
R018	1-247-863-00	CARBON 22K 5% 1/6W	
R019	1-247-863-00	CARBON 22K 5% 1/6W	
R020	1-247-849-00	CARBON 5.6K 5% 1/6W	
R021	1-247-849-00	CARBON 5.6K 5% 1/6W	
R022	1-247-849-00	CARBON 5.6K 5% 1/6W	
R023	1-247-849-00	CARBON 5.6K 5% 1/6W	
R024	1-247-849-00	CARBON 5.6K 5% 1/6W	
R025	1-247-863-00	CARBON 22K 5% 1/6W	
R026	1-247-859-00	CARBON 15K 5% 1/6W	

SWITCH

Ref.No.	Part No.	Description	Remark
S101	1-554-303-00	SWITCH, KEY BOARD	
S102	1-554-303-00	SWITCH, KEY BOARD	
S103	1-554-303-00	SWITCH, KEY BOARD	
S104	1-554-303-00	SWITCH, KEY BOARD	
S105	1-554-303-00	SWITCH, KEY BOARD	
S106	1-554-303-00	SWITCH, KEY BOARD	
S107	1-554-303-00	SWITCH, KEY BOARD	
S108	1-554-303-00	SWITCH, KEY BOARD	
S109	1-554-303-00	SWITCH, KEY BOARD	
S110	1-554-303-00	SWITCH, KEY BOARD	
S111	1-554-303-00	SWITCH, KEY BOARD	
S112	1-554-303-00	SWITCH, KEY BOARD	
S113	1-554-303-00	SWITCH, KEY BOARD	
S114	1-554-303-00	SWITCH, KEY BOARD	

CRYSTAL

Ref.No.	Part No.	Description	Remark
X001	1-567-121-00	VIBRATOR, CRYSTAL	

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Ref.No.	Part No.	Description	Remark
	♠:1-610-856-00	TS-31 BOARD ***********	
	3-681-945-00	SHEET (A), PROTECTION	

CAPACITOR

Ref.No.	Part No.	Description	Remark
C201	1-101-361-00	CERAMIC 150PF 5% 50V	
C202	1-102-852-00	CERAMIC 47PF 5% 50V	

FILTER

Ref.No.	Part No.	Description	Remark
CF201	1-567-127-00	OSCILLATOR, CERAMIC	

Ref.No.	Part No.	Description				Remark
		INDICATOR TUBE				
FL201	1-519-302-00	INDICATOR TUBE, FLUORESCENT				
		IC				
IC201	8-759-902-08	IC TMS5111NLL				
IC202	8-759-902-07	IC CM62063U				
		RESISTOR				
R201	1-247-839-00	CARBON	2.2K	5%	1/6W	
R202	1-247-827-00	CARBON	680	5%	1/6W	
R203	1-247-873-00	CARBON	56K	5%	1/6W	

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	♠:1-610-857-00	TS-35 BOARD ***********	
		DIODE	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-911-19	DIODE 1SS119	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-911-19	DIODE 1SS119	
D306	8-719-911-19	DIODE 1SS119	
D307	8-719-911-19	DIODE 1SS119	
D308	8-719-911-19	DIODE 1SS119	
		SWITCH	
S301	1-553-997-00	SWITCH, KEY BOARD	
S302	1-553-997-00	SWITCH, KEY BOARD	
S303	1-553-997-00	SWITCH, KEY BOARD	
S304	1-553-997-00	SWITCH, KEY BOARD	
S305	1-553-997-00	SWITCH, KEY BOARD	
S306	1-553-997-00	SWITCH, KEY BOARD	
S307	1-553-997-00	SWITCH, KEY BOARD	
S308	1-553-997-00	SWITCH, KEY BOARD	
S309	1-554-375-00	SWITCH, PUSH	

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	♠:1-610-858-00	TS-36 BOARD ***********	
		DIODE	
D401	8-719-911-19	DIODE 1SS119	
		SWITCH	
S401	1-553-997-00	SWITCH, KEY BOARD	

Ref.No.	Part No.	Description				Remark
	♠:A-6717-333-A	SS-13 (B-299) BOARD, COMPLETE ******************************				
	♠:1-560-891-00	PIN, CONNECTOR 3P				
	♠:1-560-892-00	PIN, CONNECTOR 4P				
	♠:3-655-214-00	CLIP, CABLE				
	♠:3-679-172-00	HEAT SINK, SS				
	7-682-149-01	SCREW +P 3X10				
		CAPACITOR				
C001	1-130-483-00	MYLAR	0.01MF	5%	50V	
C002	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C003	1-123-354-00	ELECT	3.3MF	20%	50V	
C004	1-123-354-00	ELECT	3.3MF	20%	50V	
C005	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C006	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C007	1-123-354-00	ELECT	3.3MF	20%	50V	
C008	1-130-483-00	MYLAR	0.01MF	5%	50V	
C009	1-130-483-00	MYLAR	0.01MF	5%	50V	
C010	1-123-330-00	ELECT	22MF	20%	16V	
C011	1-127-469-00	ELECT(SOLID)	0.33MF	5%	16V	
C012	1-130-491-00	MYLAR	0.047MF	5%	50V	
C013	1-123-332-00	ELECT	47MF	20%	16V	
C014	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C015	1-123-356-00	ELECT	10MF	20%	16V	
C016	1-123-381-00	ELECT	2.2MF	20%	50V	
C019	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C020	1-123-332-00	ELECT	47MF	20%	16V	
C021	1-123-381-00	ELECT	2.2MF	20%	50V	
C022	1-123-381-00	ELECT	2.2MF	20%	50V	
C023	1-131-369-00	TANTALUM	4.7MF	10%	16V	
C024	1-131-369-00	TANTALUM	4.7MF	10%	16V	
C025	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C026	1-123-332-00	ELECT	47MF	20%	16V	
C027	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C028	1-123-310-00	ELECT	470MF	20%	10V	
C029	1-161-004-00	CERAMIC	0.0018MF	10%	25V	
C030	1-108-582-00	MYLAR	0.013MF	5%	50V	
C031	1-131-398-00	ELECT(SOLID)	0.22MF	10%	16V	
C032	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C033	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C034	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C035	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C036	1-161-016-00	CERAMIC	0.018MF	10%	25V	
C037	1-123-356-00	ELECT	10MF	20%	16V	
C038	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C039	1-123-356-00	ELECT	10MF	20%	16V	
C040	1-124-429-00	ELECT	0.68MF	20%	50V	
C041	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C044	1-123-332-00	ELECT	47MF	20%	16V	
C045	1-102-961-00	CERAMIC	27PF	5%	50V	
C046	1-102-961-00	CERAMIC	27PF	5%	50V	

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Ref.No.	Part No.	Description				Remark
C047	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C048	1-101-886-00	CERAMIC	62PF	5%	50V	
C049	1-123-332-00	ELECT	47MF	20%	16V	
C050	1-127-437-51	ELECT(SOLID)	0.47MF	10%	16V	
C201	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C202	1-123-330-00	ELECT	22MF	20%	16V	
C203	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C204	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C205	1-123-381-00	ELECT	2.2MF	20%	50V	
C206	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C207	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C301	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C302	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C303	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C304	1-123-356-00	ELECT	10MF	20%	16V	
C305	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C401	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C402	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C403	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C404	1-123-380-00	ELECT	1MF	20%	50V	
C405	1-123-330-00	ELECT	22MF	20%	16V	
C406	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C407	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C408	1-123-330-00	ELECT	22MF	20%	16V	
C409	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C410	1-123-356-00	ELECT	10MF	20%	25V	
C411	1-161-019-00	CERAMIC	0.033MF	10%	25V	
C501	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C502	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C503	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C504	1-129-794-00	FILM	0.0033MF	5%	100V	
C505	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C506	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C507	1-123-380-00	ELECT	1MF	20%	50V	
C508	1-161-017-00	CERAMIC	0.022MF	10%	25V	
C509	1-123-380-00	ELECT	1MF	20%	50V	
C510	1-161-002-00	CERAMIC	0.0012MF	10%	25V	
C511	1-123-379-00	ELECT	0.47MF	20%	50V	
C601	1-123-380-00	ELECT	1MF	20%	50V	
C602	1-123-356-00	ELECT	10MF	20%	16V	
C603	1-123-380-00	ELECT	1MF	20%	50V	
C751	1-123-333-00	ELECT	100MF	20%	16V	
C752	1-123-332-00	ELECT	47MF	20%	16V	
C754	1-161-021-00	CERAMIC	0.047MF	10%	25V	

FILTER

Ref.No.	Part No.	Description	Remark
CF401	1-527-532-00	OSCILLATOR, CERAMIC	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN001♠:	1-560-892-00	PIN, CONNECTOR 4P	
CN002♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN003♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN004♠:	1-560-892-00	PIN, CONNECTOR 4P	
CN005	1-560-466-00	PIN, CONNECTOR 3P	
CN006♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN007♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN008♠:	1-560-892-00	PIN, CONNECTOR 4P	
CN009♠:	1-560-900-00	PIN, CONNECTOR 12P	
CN010♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN401♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN402♠:	1-560-898-00	PIN, CONNECTOR 10P	
CN403♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN404♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN405♠:	1-560-898-00	PIN, CONNECTOR 10P	
CN406♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN407♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN408♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN409♠:	1-560-898-00	PIN, CONNECTOR 10P	
CN410♠:	1-560-896-00	PIN, CONNECTOR 8P	
CN411♠:	1-560-893-00	PIN, CONNECTOR 5P	
CN412♠:	1-560-892-00	PIN, CONNECTOR 4P	
CN412♠:	1-560-892-00	PIN, CONNECTOR 4P	
CN413♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN414♠:	1-560-892-00	PIN, CONNECTOR 4P	
CN415♠:	1-560-891-00	PIN, CONNECTOR 3P	
CN416♠:	1-560-890-00	PIN, CONNECTOR 2P	
CN417♠:	1-560-892-00	PIN, CONNECTOR 4P	

COMPOSITION CIRCUIT BLOCK

Ref.No.	Part No.	Description	Remark
CP401	1-231-613-00	COMPOSITION CIRCUIT BLOCK	

DIODE

Ref.No.	Part No.	Description	Remark
D001	8-719-101-76	DIODE RD10E-L2	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-911-19	DIODE 1SS119	
D008	8-719-911-19	DIODE 1SS119	
D009	8-719-911-19	DIODE 1SS119	
D010	8-719-911-19	DIODE 1SS119	
D202	8-719-911-19	DIODE 1SS119	
D203	8-719-911-19	DIODE 1SS119	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-911-19	DIODE 1SS119	
D206	8-719-911-19	DIODE 1SS119	
D207	8-719-911-19	DIODE 1SS119	
D208	8-719-911-19	DIODE 1SS119	
D209	8-719-911-19	DIODE 1SS119	
D210	8-719-911-19	DIODE 1SS119	
D211	8-719-911-19	DIODE 1SS119	
D212	8-719-911-19	DIODE 1SS119	
D213	8-719-911-19	DIODE 1SS119	
D214	8-719-911-19	DIODE 1SS119	
D216	8-719-911-19	DIODE 1SS119	
D217	8-719-911-19	DIODE 1SS119	

Ref.No.	Part No.	Description	Remark
D218	8-719-911-19	DIODE 1SS119	
D301	8-719-101-77	DIODE RD10E-L3	
D302	⚠8-719-100-66	DIODE RD12E-B3	
D303	8-719-911-19	DIODE 1SS119	
D401	8-719-911-19	DIODE 1SS119	
D402	8-719-911-19	DIODE 1SS119	
D403	8-719-911-19	DIODE 1SS119	
D404	8-719-911-19	DIODE 1SS119	
D405	8-719-911-19	DIODE 1SS119	
D407	8-719-911-19	DIODE 1SS119	
D410	8-719-911-19	DIODE 1SS119	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
D503	8-719-911-19	DIODE 1SS119	
D601	8-719-911-19	DIODE 1SS119	
D602	8-719-101-70	DIODE RD8.2E-L2	
D603	8-719-911-19	DIODE 1SS119	
D751	8-719-101-49	DIODE RD5.1E-L1	
D752	8-719-911-19	DIODE 1SS119	
D753	8-719-911-19	DIODE 1SS119	

IC

Ref.No.	Part No.	Description	Remark
IC001	- - -	IC CX-194B-0	
IC002	8-759-135-80	IC UPC358C	
IC003	8-759-145-58	IC UPC4558C	
IC004	8-759-240-53	IC TC4053BP	
IC005	8-759-132-40	IC UPC324C	
IC006	8-759-132-40	IC UPC324C	
IC301	8-759-907-28	IC M32080SL	
IC401	8-759-101-66	IC UPD553C-276	
IC402	8-759-101-68	IC UPD553C-287	

COIL

Ref.No.	Part No.	Description	Remark
L001	1-408-615-00	MICRO INDUCTOR 100UH	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q001	=>8-729-245-83	TRANSISTOR 2SC2458	
Q002	=>8-729-245-83	TRANSISTOR 2SC2458	
Q003	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q004	=>8-729-177-43	TRANSISTOR 2SD774	
Q005	8-729-606-32	TRANSISTOR 2SC2603	
Q006	=>8-729-245-83	TRANSISTOR 2SC2458	
Q007	=>8-729-245-83	TRANSISTOR 2SC2458	
Q008	=>8-729-245-83	TRANSISTOR 2SC2458	
Q009	=>8-729-245-83	TRANSISTOR 2SC2458	
Q201	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q202	=>8-729-245-83	TRANSISTOR 2SC2458	
Q203	8-729-316-16	TRANSISTOR 2SC1061	
Q204	=>8-729-245-83	TRANSISTOR 2SC2458	
Q205	=>8-729-245-83	TRANSISTOR 2SC2458	
Q206	=>8-729-245-83	TRANSISTOR 2SC2458	
Q207	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q208	=>8-729-177-43	TRANSISTOR 2SD774	
Q209	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q210	=>8-729-177-43	TRANSISTOR 2SD774	
Q211	=>8-729-177-32	TRANSISTOR 2SD773	
Q212	8-729-116-42	TRANSISTOR 2SD1164	
Q213	=>8-729-177-32	TRANSISTOR 2SD773	
Q214	8-729-116-42	TRANSISTOR 2SD1164	
Q215	=>8-729-245-83	TRANSISTOR 2SC2458	
Q216	=>8-729-245-83	TRANSISTOR 2SC2458	
Q217	=>8-729-245-83	TRANSISTOR 2SC2458	
Q218	=>8-729-245-83	TRANSISTOR 2SC2458	
Q221	=>8-729-177-32	TRANSISTOR 2SD773	
Q222	=>8-729-245-83	TRANSISTOR 2SC2458	
Q223	8-729-374-02	TRANSISTOR 2SB740	
Q224	=>8-729-177-43	TRANSISTOR 2SD774	
Q225	8-729-374-02	TRANSISTOR 2SB740	
Q226	=>8-729-177-43	TRANSISTOR 2SD774	
Q227	=>8-729-245-83	TRANSISTOR 2SC2458	
Q302	=>8-729-245-83	TRANSISTOR 2SC2458	
Q303	=>8-729-245-83	TRANSISTOR 2SC2458	
Q304	=>8-729-245-83	TRANSISTOR 2SC2458	
Q305	=>8-729-245-83	TRANSISTOR 2SC2458	
Q306	=>8-729-245-83	TRANSISTOR 2SC2458	
Q307	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q308	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q309	⚠8-729-177-32	TRANSISTOR 2SD773	
Q401	=>8-729-245-83	TRANSISTOR 2SC2458	
Q402	=>8-729-245-83	TRANSISTOR 2SC2458	
Q403	=>8-729-245-83	TRANSISTOR 2SC2458	
Q404	=>8-729-245-83	TRANSISTOR 2SC2458	
Q405	=>8-729-245-83	TRANSISTOR 2SC2458	
Q406	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q407	=>8-729-245-83	TRANSISTOR 2SC2458	
Q408	8-729-374-02	TRANSISTOR 2SB740	
Q409	8-729-606-32	TRANSISTOR 2SC2603	
Q410	=>8-729-245-83	TRANSISTOR 2SC2458	
Q411	=>8-729-245-83	TRANSISTOR 2SC2458	
Q412	=>8-729-245-83	TRANSISTOR 2SC2458	
Q413	=>8-729-245-83	TRANSISTOR 2SC2458	
Q414	=>8-729-245-83	TRANSISTOR 2SC2458	
Q501	=>8-729-245-83	TRANSISTOR 2SC2458	
Q502	=>8-729-245-83	TRANSISTOR 2SC2458	
Q503	=>8-729-245-83	TRANSISTOR 2SC2458	
Q504	=>8-729-245-83	TRANSISTOR 2SC2458	
Q505	=>8-729-245-83	TRANSISTOR 2SC2458	
Q601	=>8-729-245-83	TRANSISTOR 2SC2458	
Q602	=>8-729-245-83	TRANSISTOR 2SC2458	
Q603	=>8-729-245-83	TRANSISTOR 2SC2458	
Q751	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q752	=>8-729-245-83	TRANSISTOR 2SC2458	
Q754	8-729-606-32	TRANSISTOR 2SC2603	
Q755	=>8-729-245-83	TRANSISTOR 2SC2458	
Q756	=>8-729-245-83	TRANSISTOR 2SC2458	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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Ref.No.	Part No.	Description				Remark
		RESISTOR				
R001	1-247-831-00	CARBON	1K	5%	1/6W	
R002	1-247-871-00	CARBON	47K	5%	1/6W	
R003	1-247-859-00	CARBON	15K	5%	1/6W	
R004	1-247-851-00	CARBON	6.8K	5%	1/6W	
R005	1-247-863-00	CARBON	22K	5%	1/6W	
R006	1-247-863-00	CARBON	22K	5%	1/6W	
R007	1-247-847-00	CARBON	4.7K	5%	1/6W	
R008	1-247-871-00	CARBON	47K	5%	1/6W	
R009	1-247-863-00	CARBON	22K	5%	1/6W	
R010	1-247-863-00	CARBON	22K	5%	1/6W	
R011	1-247-829-00	CARBON	820	5%	1/6W	
R012	1-244-844-00	CARBON	62	5%	1/2W	
R013	1-247-821-00	CARBON	390	5%	1/6W	
R014	⚠1-212-855-00	FUSIBLE	8.2	5%	1/4W	F
R015	1-247-855-00	CARBON	10K	5%	1/6W	
R016	1-247-855-00	CARBON	10K	5%	1/6W	
R017	1-244-845-51	CARBON	68	5%	1/2W	
R018	1-247-831-00	CARBON	1K	5%	1/6W	
R019	1-247-829-00	CARBON	820	5%	1/6W	
R020	1-247-841-00	CARBON	2.7K	5%	1/6W	
R021	1-247-879-00	CARBON	100K	5%	1/6W	
R022	1-247-844-00	CARBON	3.6K	5%	1/6W	
R023	1-247-831-00	CARBON	1K	5%	1/6W	
R024	1-247-855-00	CARBON	10K	5%	1/6W	
R027	1-247-879-00	CARBON	100K	5%	1/6W	
R028	1-247-844-00	CARBON	3.6K	5%	1/6W	
R029	1-247-885-00	CARBON	180K	5%	1/6W	
R031	1-247-844-00	CARBON	3.6K	5%	1/6W	
R032	1-247-859-00	CARBON	15K	5%	1/6W	
R034	1-247-863-00	CARBON	22K	5%	1/6W	
R035	1-247-831-00	CARBON	1K	5%	1/6W	
R036	1-247-903-00	CARBON	1M	5%	1/6W	
R037	1-247-835-00	CARBON	1.5K	5%	1/6W	
R038	1-247-855-00	CARBON	10K	5%	1/6W	
R039	1-247-867-00	CARBON	33K	5%	1/6W	
R040	1-247-903-00	CARBON	1M	5%	1/6W	
R042	1-247-831-00	CARBON	1K	5%	1/6W	
R043	1-247-855-00	CARBON	10K	5%	1/6W	
R044	1-247-879-00	CARBON	100K	5%	1/6W	
R045	1-247-871-00	CARBON	47K	5%	1/6W	
R046	1-247-903-00	CARBON	1M	5%	1/6W	
R047	1-247-831-00	CARBON	1K	5%	1/6W	
R048	1-247-855-00	CARBON	10K	5%	1/6W	
R049	1-247-879-00	CARBON	100K	5%	1/6W	
R050	1-247-879-00	CARBON	100K	5%	1/6W	
R051	1-247-875-00	CARBON	68K	5%	1/6W	
R052	1-247-875-00	CARBON	68K	5%	1/6W	
R053	1-247-879-00	CARBON	100K	5%	1/6W	
R054	1-247-875-00	CARBON	68K	5%	1/6W	
R055	1-247-858-00	CARBON	13K	5%	1/6W	
R056	1-247-853-00	CARBON	8.2K	5%	1/6W	
R057	1-214-160-00	METAL	15K	1%	1/4W	
R058	1-247-862-00	CARBON	20K	5%	1/6W	
R059	1-247-841-00	CARBON	2.7K	5%	1/6W	
R060	1-247-844-00	CARBON	3.6K	5%	1/6W	
R061	1-247-847-00	CARBON	4.7K	5%	1/6W	
R062	1-247-883-00	CARBON	150K	5%	1/6W	
R063	1-247-883-00	CARBON	150K	5%	1/6W	
R064	1-247-848-00	CARBON	5.1K	5%	1/6W	
R065	1-247-847-00	CARBON	4.7K	5%	1/6W	
R066	1-247-903-00	CARBON	1M	5%	1/6W	
R067	1-247-867-00	CARBON	33K	5%	1/6W	
R068	1-247-876-00	CARBON	75K	5%	1/6W	
R069	1-247-883-00	CARBON	150K	5%	1/6W	
R070	1-247-867-00	CARBON	33K	5%	1/6W	
R071	1-247-879-00	CARBON	100K	5%	1/6W	
R072	1-247-879-00	CARBON	100K	5%	1/6W	
R073	1-247-871-00	CARBON	47K	5%	1/6W	
R074	1-247-871-00	CARBON	47K	5%	1/6W	
R075	1-247-857-00	CARBON	12K	5%	1/6W	
R076	1-247-859-00	CARBON	15K	5%	1/6W	
R077	1-247-887-00	CARBON	220K	5%	1/6W	
R078	1-247-887-00	CARBON	220K	5%	1/6W	
R079	1-247-865-00	CARBON	27K	5%	1/6W	
R080	1-247-848-00	CARBON	5.1K	5%	1/6W	
R081	1-247-867-00	CARBON	33K	5%	1/6W	
R082	1-247-900-00	CARBON	750K	5%	1/6W	
R083	1-247-873-00	CARBON	56K	5%	1/6W	
R084	1-247-856-00	CARBON	11K	5%	1/6W	
R085	1-247-853-00	CARBON	8.2K	5%	1/6W	
R086	1-247-867-00	CARBON	33K	5%	1/6W	
R087	1-247-867-00	CARBON	33K	5%	1/6W	
R088	1-247-855-00	CARBON	10K	5%	1/6W	
R089	1-247-865-00	CARBON	27K	5%	1/6W	
R090	1-247-856-00	CARBON	11K	5%	1/6W	
R091	1-247-837-00	CARBON	1.8K	5%	1/6W	
R092	1-247-839-00	CARBON	2.2K	5%	1/6W	
R093	1-247-839-00	CARBON	2.2K	5%	1/6W	
R095	1-247-864-00	CARBON	24K	5%	1/6W	
R097	1-247-893-00	CARBON	390K	5%	1/6W	
R098	1-247-849-00	CARBON	5.6K	5%	1/6W	
R099	1-247-879-00	CARBON	100K	5%	1/6W	
R100	1-247-879-00	CARBON	100K	5%	1/6W	
R202	1-247-847-00	CARBON	4.7K	5%	1/6W	
R203	⚠1-212-360-00	METAL OXIDE	1	5%	1W	F
R204	⚠1-246-981-00	CARBON	4.7	5%	1/8W	F
R205	1-247-871-00	CARBON	47K	5%	1/6W	
R206	1-247-855-00	CARBON	10K	5%	1/6W	
R207	1-247-871-00	CARBON	47K	5%	1/6W	
R208	1-247-867-00	CARBON	33K	5%	1/6W	
R209	1-214-132-00	METAL	1K	1%	1/4W	
R210	1-247-838-00	CARBON	2K	5%	1/6W	
R211	1-247-847-00	CARBON	4.7K	5%	1/6W	
R212	⚠1-212-360-00	METAL OXIDE	1	5%	1W	F

NOTE:

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Ref.No.	Part No.	Description				Remark
R213	⚠1-246-981-00	CARBON	4.7	5%	1/8W	F
R214	1-247-855-00	CARBON	10K	5%	1/6W	
R215	1-247-855-00	CARBON	10K	5%	1/6W	
R216	1-247-855-00	CARBON	10K	5%	1/6W	
R217	1-247-855-00	CARBON	10K	5%	1/6W	
R218	1-247-855-00	CARBON	10K	5%	1/6W	
R219	1-247-855-00	CARBON	10K	5%	1/6W	
R220	⚠1-246-981-00	CARBON	4.7	5%	1/8W	F
R221	1-247-863-00	CARBON	22K	5%	1/6W	
R222	1-247-843-00	CARBON	3.3K	5%	1/6W	
R223	1-247-849-00	CARBON	5.6K	5%	1/6W	
R224	1-247-855-00	CARBON	10K	5%	1/6W	
R225	1-247-855-00	CARBON	10K	5%	1/6W	
R226	1-247-863-00	CARBON	22K	5%	1/6W	
R227	1-247-863-00	CARBON	22K	5%	1/6W	
R228	1-247-863-00	CARBON	22K	5%	1/6W	
R230	1-247-849-00	CARBON	5.6K	5%	1/6W	
R231	1-247-863-00	CARBON	22K	5%	1/6W	
R233	⚠1-212-366-00	METAL OXIDE	3.3	5%	1W	F
R234	1-247-863-00	CARBON	22K	5%	1/6W	
R235	1-247-863-00	CARBON	22K	5%	1/6W	
R236	1-247-831-00	CARBON	1K	5%	1/6W	
R237	1-247-849-00	CARBON	5.6K	5%	1/6W	
R238	1-247-831-00	CARBON	1K	5%	1/6W	
R239	⚠1-212-360-00	METAL OXIDE	1	5%	1W	F
R240	1-247-849-00	CARBON	5.6K	5%	1/6W	
R241	1-247-831-00	CARBON	1K	5%	1/6W	
R242	1-247-831-00	CARBON	1K	5%	1/6W	
R243	1-247-863-00	CARBON	22K	5%	1/6W	
R244	1-247-863-00	CARBON	22K	5%	1/6W	
R245	1-247-801-00	CARBON	56	5%	1/6W	
R247	1-247-871-00	CARBON	47K	5%	1/6W	
R249	1-247-858-00	CARBON	13K	5%	1/6W	
R301	1-247-839-00	CARBON	2.2K	5%	1/6W	
R302	1-247-855-00	CARBON	10K	5%	1/6W	
R303	1-247-837-00	CARBON	1.8K	5%	1/6W	
R304	1-247-879-00	CARBON	100K	5%	1/6W	
R305	1-247-879-00	CARBON	100K	5%	1/6W	
R306	1-247-879-00	CARBON	100K	5%	1/6W	
R307	1-247-839-00	CARBON	2.2K	5%	1/6W	
R308	1-247-855-00	CARBON	10K	5%	1/6W	
R309	1-247-871-00	CARBON	47K	5%	1/6W	
R310	1-247-871-00	CARBON	47K	5%	1/6W	
R311	1-247-837-00	CARBON	1.8K	5%	1/6W	
R312	1-247-839-00	CARBON	2.2K	5%	1/6W	
R313	1-247-871-00	CARBON	47K	5%	1/6W	
R314	1-247-871-00	CARBON	47K	5%	1/6W	
R315	1-247-871-00	CARBON	47K	5%	1/6W	
R316	1-247-871-00	CARBON	47K	5%	1/6W	
R317	1-247-855-00	CARBON	10K	5%	1/6W	
R318	1-247-831-00	CARBON	1K	5%	1/6W	
R319	1-247-895-00	CARBON	470K	5%	1/6W	
R320	1-247-895-00	CARBON	470K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R321	1-247-879-00	CARBON	100K	5%	1/6W	
R322	1-247-837-00	CARBON	1.8K	5%	1/6W	
R323	1-247-879-00	CARBON	100K	5%	1/6W	
R324	1-247-879-00	CARBON	100K	5%	1/6W	
R325	1-247-879-00	CARBON	100K	5%	1/6W	
R326	1-247-879-00	CARBON	100K	5%	1/6W	
R327	1-247-879-00	CARBON	100K	5%	1/6W	
R328	1-247-855-00	CARBON	10K	5%	1/6W	
R329	1-247-879-00	CARBON	100K	5%	1/6W	
R330	1-247-879-00	CARBON	100K	5%	1/6W	
R331	1-247-879-00	CARBON	100K	5%	1/6W	
R401	1-247-831-00	CARBON	1K	5%	1/6W	
R402	1-247-863-00	CARBON	22K	5%	1/6W	
R403	1-247-831-00	CARBON	1K	5%	1/6W	
R404	1-247-831-00	CARBON	1K	5%	1/6W	
R405	1-247-831-00	CARBON	1K	5%	1/6W	
R406	1-247-879-00	CARBON	100K	5%	1/6W	
R407	1-247-871-00	CARBON	47K	5%	1/6W	
R409	1-247-879-00	CARBON	100K	5%	1/6W	
R410	1-247-855-00	CARBON	10K	5%	1/6W	
R411	1-247-879-00	CARBON	100K	5%	1/6W	
R412	1-247-831-00	CARBON	1K	5%	1/6W	
R413	1-247-879-00	CARBON	100K	5%	1/6W	
R414	1-247-879-00	CARBON	100K	5%	1/6W	
R415	1-247-879-00	CARBON	100K	5%	1/6W	
R416	1-247-879-00	CARBON	100K	5%	1/6W	
R417	1-247-879-00	CARBON	100K	5%	1/6W	
R418	1-247-879-00	CARBON	100K	5%	1/6W	
R419	1-247-879-00	CARBON	100K	5%	1/6W	
R420	1-247-879-00	CARBON	100K	5%	1/6W	
R421	1-247-863-00	CARBON	22K	5%	1/6W	
R422	1-247-831-00	CARBON	1K	5%	1/6W	
R423	1-247-879-00	CARBON	100K	5%	1/6W	
R424	1-247-843-00	CARBON	3.3K	5%	1/6W	
R425	1-247-839-00	CARBON	2.2K	5%	1/6W	
R426	1-247-855-00	CARBON	10K	5%	1/6W	
R427	1-247-873-00	CARBON	56K	5%	1/6W	
R428	1-247-865-00	CARBON	27K	5%	1/6W	
R429	1-247-873-00	CARBON	56K	5%	1/6W	
R430	1-247-865-00	CARBON	27K	5%	1/6W	
R431	1-247-855-00	CARBON	10K	5%	1/6W	
R432	1-247-863-00	CARBON	22K	5%	1/6W	
R433	1-247-855-00	CARBON	10K	5%	1/6W	
R434	1-247-849-00	CARBON	5.6K	5%	1/6W	
R435	1-247-879-00	CARBON	100K	5%	1/6W	
R436	1-247-879-00	CARBON	100K	5%	1/6W	
R437	1-246-468-00	CARBON	620	5%	1/4W	
R438	1-247-879-00	CARBON	100K	5%	1/6W	
R439	1-247-873-00	CARBON	56K	5%	1/6W	
R440	1-247-865-00	CARBON	27K	5%	1/6W	
R441	1-247-863-00	CARBON	22K	5%	1/6W	
R442	1-247-809-00	CARBON	120	5%	1/6W	
R443	1-247-829-00	CARBON	820	5%	1/6W	

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SS-13 FS-19 TU-55 JK-6

Ref.No.	Part No.	Description				Remark
R444	1-247-843-00	CARBON	3.3K	5%	1/6W	
R445	1-247-849-00	CARBON	5.6K	5%	1/6W	
R446	1-247-873-00	CARBON	56K	5%	1/6W	
R447	1-247-807-00	CARBON	100	5%	1/6W	
R448	1-246-468-00	CARBON	620	5%	1/4W	
R449	1-246-468-00	CARBON	620	5%	1/4W	
R450	1-246-470-00	CARBON	750	5%	1/4W	
R451	1-246-468-00	CARBON	620	5%	1/4W	
R452	1-247-879-00	CARBON	100K	5%	1/6W	
R453	1-247-843-00	CARBON	3.3K	5%	1/6W	
R454	1-247-871-00	CARBON	47K	5%	1/6W	
R455	1-247-801-00	CARBON	56	5%	1/6W	
R456	1-247-879-00	CARBON	100K	5%	1/6W	
R458	1-247-835-00	CARBON	1.5K	5%	1/6W	
R459	1-247-823-00	CARBON	470	5%	1/6W	
R460	1-247-855-00	CARBON	10K	5%	1/6W	
R461	1-247-879-00	CARBON	100K	5%	1/6W	
R462	1-247-849-00	CARBON	5.6K	5%	1/6W	
R463	1-247-855-00	CARBON	10K	5%	1/6W	
R465	1-247-855-00	CARBON	10K	5%	1/6W	
R501	1-247-895-00	CARBON	470K	5%	1/6W	
R502	1-247-875-00	CARBON	68K	5%	1/6W	
R503	1-247-849-00	CARBON	5.6K	5%	1/6W	
R504	1-247-831-00	CARBON	1K	5%	1/6W	
R505	1-247-855-00	CARBON	10K	5%	1/6W	
R506	1-247-879-00	CARBON	100K	5%	1/6W	
R507	1-247-886-00	CARBON	200K	5%	1/6W	
R508	1-247-841-00	CARBON	2.7K	5%	1/6W	
R509	1-247-815-00	CARBON	220	5%	1/6W	
R510	1-247-869-00	CARBON	39K	5%	1/6W	
R511	1-247-875-00	CARBON	68K	5%	1/6W	
R512	1-247-879-00	CARBON	100K	5%	1/6W	
R513	1-247-852-00	CARBON	7.5K	5%	1/6W	
R514	1-247-841-00	CARBON	2.7K	5%	1/6W	
R515	1-247-849-00	CARBON	5.6K	5%	1/6W	
R516	1-247-831-00	CARBON	1K	5%	1/6W	
R517	1-247-867-00	CARBON	33K	5%	1/6W	
R518	1-247-863-00	CARBON	22K	5%	1/6W	
R519	1-247-801-00	CARBON	56	5%	1/6W	
R520	1-247-879-00	CARBON	100K	5%	1/6W	
R601	1-247-903-00	CARBON	1M	5%	1/6W	
R602	1-247-879-00	CARBON	100K	5%	1/6W	
R603	1-247-863-00	CARBON	22K	5%	1/6W	
R604	1-247-855-00	CARBON	10K	5%	1/6W	
R605	1-247-895-00	CARBON	470K	5%	1/6W	
R606	1-247-869-00	CARBON	39K	5%	1/6W	
R607	1-247-807-00	CARBON	100	5%	1/6W	
R608	1-247-879-00	CARBON	100K	5%	1/6W	
R609	1-247-839-00	CARBON	2.2K	5%	1/6W	
R610	1-247-831-00	CARBON	1K	5%	1/6W	
R751	1-247-831-00	CARBON	1K	5%	1/6W	
R752	1-247-863-00	CARBON	22K	5%	1/6W	
R753	1-247-871-00	CARBON	47K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R754	1-247-863-00	CARBON	22K	5%	1/6W	
R755	1-247-863-00	CARBON	22K	5%	1/6W	
R758	1-247-845-00	CARBON	3.9K	5%	1/6W	
R759	1-247-855-00	CARBON	10K	5%	1/6W	
R760	1-247-831-00	CARBON	1K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-990-00	RES, ADJ, METAL GLAZE 1K
RV002	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K
RV003	1-228-991-00	RES, ADJ, METAL GLAZE 2.2K
RV004	1-228-996-00	RES, ADJ, METAL GLAZE 47K
RV005	1-228-750-00	RES, ADJ, CARBON 47K
RV006	1-228-750-00	RES, ADJ, CARBON 47K
RV008	1-228-750-00	RES, ADJ, CARBON 47K
RV009	1-228-747-00	RES, ADJ, CARBON 4.7K

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♠:1-609-219-00 FS-19 BOARD
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DIODE

D001	8-719-812-32	DIODE TLY123
D002	8-719-812-33	DIODE TLG123A

SWITCH

S001	1-553-766-00	SWITCH, KEY BOARD
S002	1-553-766-00	SWITCH, KEY BOARD
S003	1-553-766-00	SWITCH, KEY BOARD
S004	1-553-766-00	SWITCH, KEY BOARD
S005	1-553-766-00	SWITCH, KEY BOARD

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♠:1-610-854-00 TU-55 BOARD
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⚠.1-463-399-00 TUNER (BT-866)

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♠:1-610-694-00 JK-6 BOARD
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CAPACITOR

C001	1-161-021-00	CERAMIC	0.047MF	10%	25V

JACK

CNJ001	1-507-892-00	JACK, PIN 1P
CNJ002	1-507-841-00	JACK, MINIATURE
CNJ003	1-507-588-32	JACK, PIN, 1P
CNJ004	1-507-840-00	JACK, MINIATURE

RESISTOR

R002	1-247-875-00	CARBON	68K	5%	1/6W
R003	1-247-815-00	CARBON	220	5%	1/6W

NOTE:

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Ref.No.	Part No.	Description				Remark
R004	1-247-804-00	CARBON	75	5%	1/6W	
R005	1-247-799-00	CARBON	47	5%	1/6W	

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♠:1-610-587-00 PS-26 BOARD
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1-533-162-00 HOLDER, FUSE

CAPACITOR

Ref.No.	Part No.	Description				Remark
C101	⚠.1-130-680-00	FILM	0.1MF	20%		125V
C102	⚠.1-161-747-00	CERAMIC	2200PF	20%		125V
C103	⚠.1-161-747-00	CERAMIC	2200PF	20%		125V
C104	1-125-298-00	ELECT(BLOCK)	10000MF	20%		25V
C105	1-123-332-00	ELECT	47MF	20%		16V
C106	1-161-021-00	CERAMIC	0.047MF	10%		25V

CONNECTOR

Ref.No.	Part No.	Description
CN101	1-564-321-00	PIN, CONNECTOR 2P
CN102	1-564-320-00	PIN, CONNECTOR 2P

DIODE

Ref.No.	Part No.	Description
D101	⚠.8-719-300-67	DIODE RB602F
D102	8-719-100-98	DIODE RD30E-B3

FUSE

Ref.No.	Part No.	Description
F101	⚠.1-532-591-00	FUSE, GLASS TUBE 2A 125V
F102	⚠.1-532-557-00	FUSE, GLASS TUBE 3.15A 125V

IC

Ref.No.	Part No.	Description
IC101	⚠.8-749-990-12	IC STR9012

TRANSISTOR

Ref.No.	Part No.	Description
Q101	⚠.8-729-178-54	TRANSISTOR 2SC2785

RESISTOR

Ref.No.	Part No.	Description				Remark
R101	⚠.1-202-723-00	SOLID	2.2M	10%	1/2W	
R103	1-247-855-00	CARBON	10K	5%	1/6W	
R104	1-247-855-00	CARBON	10K	5%	1/6W	
R105	1-247-855-00	CARBON	10K	5%	1/6W	

TRANSFORMER

Ref.No.	Part No.	Description
T101	⚠.1-421-357-31	TRANSFORMER, LINE FILTER

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♠:1-610-588-00 PS-27 BOARD
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CAPACITOR

Ref.No.	Part No.	Description				Remark
C001	1-123-388-00	ELECT	100MF	20%		100V
C003	1-123-311-00	ELECT	1000MF	20%		10V
C004	1-123-345-00	ELECT	100MF	20%		35V
C005	1-123-356-00	ELECT	10MF	20%		16V
C006	1-123-356-00	ELECT	10MF	20%		16V
C007	1-123-356-00	ELECT	10MF	20%		16V
C008	1-123-306-00	ELECT	47MF	20%		10V
C009	1-123-306-00	ELECT	47MF	20%		10V
C010	1-123-380-00	ELECT	1MF	20%		50V
C011	1-161-070-00	CERAMIC	0.01MF	20%		50V
C012	1-125-347-00	DOUBLE LAYER	0.22F			5V
C013	1-123-332-00	ELECT	47MF	20%		16V
C018	1-161-021-00	CERAMIC	0.047MF	10%		25V

CONNECTOR

Ref.No.	Part No.	Description
CN001	♠:1-560-896-00	PIN, CONNECTOR 8P
CN002	♠:1-560-898-00	PIN, CONNECTOR 10P
CN003	♠:1-560-898-00	PIN, CONNECTOR 10P
CN004	♠:1-560-894-00	PIN, CONNECTOR 6P

DIODE

Ref.No.	Part No.	Description
D001	8-719-200-02	DIODE 10E2
D002	8-719-200-02	DIODE 10E2
D003	8-719-200-02	DIODE 10E2
D004	8-719-200-02	DIODE 10E2
D005	8-719-200-02	DIODE 10E2
D006	8-719-100-38	DIODE RD6.2E-B2
D007	8-719-100-29	DIODE RD5.1E-B1
D008	8-719-100-66	DIODE RD12E-B3
D009	8-719-100-38	DIODE RD6.2E-B2
D010	8-719-200-02	DIODE 10E2
D011	8-719-200-02	DIODE 10E2
D012	8-719-911-19	DIODE 1SS119
D013	8-719-911-19	DIODE 1SS119
D014	8-719-100-38	DIODE RD6.2E-B2
D016	8-719-100-29	DIODE RD5.1E-B1
D017	8-719-200-02	DIODE 10E2

TRANSISTOR

Ref.No.	Part No.	Description
Q001	=>8-729-177-32	TRANSISTOR 2SD773
Q002	8-729-113-32	TRANSISTOR 2SB733

RESISTOR

Ref.No.	Part No.	Description				Remark
R001	⚠.1-212-958-00	FUSIBLE	10	5%	1/2W	F
R002	⚠.1-212-934-00	FUSIBLE	1	5%	1/2W	F
R003	⚠.1-212-934-00	FUSIBLE	1	5%	1/2W	F
R004	1-247-839-00	CARBON	2.2K	5%	1/6W	
R005	1-247-839-00	CARBON	2.2K	5%	1/6W	
R006	⚠.1-212-958-00	FUSIBLE	10	5%	1/2W	F
R007	1-246-449-00	CARBON	100	5%	1/4W	
R008	1-247-831-00	CARBON	1K	5%	1/6W	
R009	1-247-873-00	CARBON	56K	5%	1/6W	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

PS-29 PS-30 CI-5 TA-16

Ref.No.	Part No.	Description	Remark
	♦:1-610-589-00	PS-29 BOARD ***********	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q220	=>8-729-316-16	TRANSISTOR 2SC1061	

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Ref.No.	Part No.	Description	Remark
	♦:1-610-590-00	PS-30 BOARD ***********	

SWITCH

Ref.No.	Part No.	Description	Remark
S201	1-554-377-00	SWITCH, SLIDE	

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Ref.No.	Part No.	Description	Remark
	♦:1-610-595-00	CI-5 BOARD **********	
	7-685-860-01	SCREW +BVTT 2.6X4 (S)	

CAPACITOR

Ref.No.	Part No.	Description	Remark
C001	1-123-380-00	ELECT 1MF 20% 50V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN001	♦:1-560-899-00	PIN, CONNECTOR 11P	
CN002	♦:1-560-896-00	PIN, CONNECTOR 8P	
CN003	♦:1-560-897-00	PIN, CONNECTOR 9P	
CN004	♦:1-560-891-00	PIN, CONNECTOR 3P	
CN005	♦:1-560-894-00	PIN, CONNECTOR 6P	
CN006	1-561-703-00	CONNECTOR, DIN 8P	

DIODE

Ref.No.	Part No.	Description	Remark
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	

FUSE

Ref.No.	Part No.	Description	Remark
F001	⚠1-532-624-00	FUSE, GLASS TUBE 0.5A 125V	

IC

Ref.No.	Part No.	Description	Remark
IC001	8-759-906-95	IC MB8791	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q001	=>8-729-245-83	TRANSISTOR 2SC2458	
Q002	=>8-729-245-83	TRANSISTOR 2SC2458	
Q003	=>8-729-245-83	TRANSISTOR 2SC2458	
Q004	=>8-729-245-83	TRANSISTOR 2SC2458	
Q005	=>8-729-245-83	TRANSISTOR 2SC2458	
Q006	=>8-729-245-83	TRANSISTOR 2SC2458	
Q007	=>8-729-245-83	TRANSISTOR 2SC2458	
Q008	=>8-729-204-83	TRANSISTOR 2SA1048-GR	

RESISTOR

Ref.No.	Part No.	Description			Remark
R001	1-247-855-00	CARBON	10K	5%	1/6W
R002	1-247-855-00	CARBON	10K	5%	1/6W
R003	1-247-855-00	CARBON	10K	5%	1/6W
R004	1-247-855-00	CARBON	10K	5%	1/6W
R005	1-247-867-00	CARBON	33K	5%	1/6W
R006	1-247-867-00	CARBON	33K	5%	1/6W
R007	1-247-855-00	CARBON	10K	5%	1/6W
R008	1-247-855-00	CARBON	10K	5%	1/6W
R009	1-247-855-00	CARBON	10K	5%	1/6W
R010	1-247-855-00	CARBON	10K	5%	1/6W
R011	1-247-867-00	CARBON	33K	5%	1/6W
R012	1-247-879-00	CARBON	100K	5%	1/6W
R013	1-247-863-00	CARBON	22K	5%	1/6W
R014	1-247-867-00	CARBON	33K	5%	1/6W
R015	1-247-879-00	CARBON	100K	5%	1/6W
R016	1-247-862-00	CARBON	20K	5%	1/6W
R017	1-247-867-00	CARBON	33K	5%	1/6W
R018	1-247-867-00	CARBON	33K	5%	1/6W
R019	1-247-855-00	CARBON	10K	5%	1/6W
R020	1-247-873-00	CARBON	56K	5%	1/6W
R021	1-247-855-00	CARBON	10K	5%	1/6W
R022	1-247-855-00	CARBON	10K	5%	1/6W
R023	1-247-855-00	CARBON	10K	5%	1/6W
R024	1-247-855-00	CARBON	10K	5%	1/6W
R025	1-247-829-00	CARBON	820	5%	1/6W
R026	1-247-831-00	CARBON	1K	5%	1/6W
R027	1-247-831-00	CARBON	1K	5%	1/6W
R028	1-247-831-00	CARBON	1K	5%	1/6W
R029	1-247-831-00	CARBON	1K	5%	1/6W

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Ref.No.	Part No.	Description	Remark
	♦;A-6721-183-A	TA-16 BOARD COMPLETE ********************	

CAPACITOR

Ref.No.	Part No.	Description			Remark
C001	1-102-074-00	CERAMIC	0.001MF	10%	50V
C002	1-130-487-00	FILM	0.022MF	5%	50V
C003	1-123-608-00	ELECT	0.22MF	20%	50V
C004	1-123-608-00	ELECT	0.22MF	20%	50V
C005	1-102-526-00	CERAMIC	75PF	5%	50V
C006	1-123-333-00	ELECT	100MF	20%	16V
C007	1-101-004-00	CERAMIC	0.01MF		50V
C008	1-161-021-00	CERAMIC	0.047MF	10%	25V
C009	1-102-523-00	CERAMIC	56PF	5%	50V
C010	1-101-884-00	CERAMIC	56PF	5%	50V
C011	1-123-356-00	ELECT	10MF	20%	16V
C012	1-130-485-00	FILM	0.015MF	5%	50V
C013	1-102-851-00	CERAMIC	15PF	5%	50V
C014	1-102-495-00	CERAMIC	75PF	5%	50V
C015	1-123-380-00	ELECT	1MF	20%	50V

NOTE:

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Ref.No.	Part No.	Description			Remark
C016	1-123-330-00	ELECT	22MF	20%	16V
C017	1-102-121-00	CERAMIC	0.00-2MF	10%	50V
C018	1-123-380-00	ELECT	1MF	20%	50V
C019	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C020	1-123-379-00	ELECT	0.4MF	20%	50V
C021	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C022	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C023	1-123-379-00	ELECT	0.47MF	20%	50V
C024	1-102-816-00	CERAMIC	120PF	5%	50V
C025	1-123-333-00	ELECT	100MF	20%	16V
C026	1-102-514-00	CERAMIC	22PF	5%	50V
C028	1-123-382-00	ELECT	3.3MF	20%	100V
C029	1-123-330-00	ELECT	22MF	20%	16V
C030	1-123-330-00	ELECT	22MF	20%	16V
C031	1-130-528-51	FILM	0.1MF	10%	50V
C032	1-130-516-51	FILM	0.01MF	10%	50V
C033	1-123-330-00	ELECT	22MF	20%	16V
C034	1-123-318-00	ELECT	33MF	20%	16V
C035	1-161-036-00	CERAMIC	0.047MF	20%	25V
C036	1-123-330-00	ELECT	22MF	20%	16V
C040	1-130-516-51	EILM	0.01MF	10%	50V
C403	1-130-528-51	FILM	0.1MF	10%	50V
C404	1-123-356-00	ELECT	10MF	20%	16V
C405	1-123-607-00	ELECT	0.1MF	20%	50V
C406	1-123-379-00	ELECT	0.47MF	20%	50V
C407	1-102-074-00	CERAMIC	0.001MF	10%	50V
C408	1-102-074-00	CERAMIC	0.001MF	10%	50V
C409	1-101-004-00	CERAMIC	0.01MF		50V
C410	1-123-332-00	ELECT	47MF	20%	16V
C502	1-123-332-00	ELECT	47MF	20%	16V
C503	1-130-479-00	FILM	0.0047MF	5%	50V
C504	1-130-477-00	FILM	0.0033MF	5%	50V
C505	1-102-110-00	CERAMIC	220PF	10%	50V
C506	1-130-472-00	FILM	0.0012MF	5%	50V
C507	1-123-381-00	ELECT	2.2MF	20%	50V
C508	1-123-382-00	ELECT	3.3MF	20%	50V
C509	1-136-051-00	FILM	0.0039MF	10%	630V
C510	1-130-475-00	FILM	0.0022MF	5%	50V
C511	1-123-356-00	ELECT	10MF	20%	16V
C512	1-130-471-00	FILM	0.001MF	5%	50V
C513	1-107-166-00	MIKA	62PF	5%	500V
C514	1-123-333-00	ELECT	100MF	20%	16V
C515	1-130-477-00	FILM	0.0033MF	5%	50V
C517	1-123-382-00	ELECT	3.3MF	20%	50V
C518	1-123-330-00	ELECT	22MF	20%	16V
C519	1-123-356-00	ELECT	10MF	20%	16V
C520	1-101-059-00	CERAMIC	510PF	5%	50V
C521	1-123-328-00	ELECT	4.7MF	20%	25V
C522	1-130-497-00	FILM	0.15MF	5%	50V
C523	1-123-328-00	ELECT	4.7MF	20%	25V
C524	1-123-333-00	ELECT	100MF	20%	16V
C525	1-130-482-00	FILM	0.0082MF	5%	50V
C526	1-123-328-00	ELECT	4.7MF	20%	25V
C528	1-130-516-51	FILM	0.01MF	10%	50V
C530	1-123-296-00	ELECT	220MF	20%	6.3V
C531	1-123-380-00	ELECT	1MF	20%	50V
C533	1-130-468-00	FILM	560PF	5%	50V
C534	1-123-379-00	ELECT	0.47MF	20%	50V
C535	1-123-330-00	ELECT	22MF	20%	16V
C536	1-161-021-00	CERAMIC	0.047MF	10%	25V
C537	1-130-472-00	FILM	0.0012MF	5%	50V
C601	1-161-025-00	CERAMIC	0.1MF	10%	25V
C602	1-161-025-00	CERAMIC	0.1MF	10%	25V
C603	1-101-006-00	CERAMIC	0.047MF		50V
C604	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C605	1-102-127-00	CERAMIC	0.0068MF	10%	50V
C606	1-123-356-00	ELECT	10MF	20%	16V
C607	1-102-110-00	CERAMIC	220PF	10%	50V
C608	1-123-306-00	ELECT	47MF	20%	10V
C609	1-123-382-00	ELECT	3.3MF	20%	50V
C610	1-102-106-00	CERAMIC	100PF	10%	50V
C611	1-123-306-00	ELECT	47MF	20%	10V
C612	1-123-307-00	ELECT	100MF	20%	10V
C613	1-130-493-51	FILM	0.068MF	5%	50V
C614	1-130-516-51	FILM	0.01MF	10%	50V
C615	1-123-306-00	ELECT	47MF	20%	10V
C616	1-123-307-00	ELECT	100MF	20%	10V
C617	1-101-004-00	CERAMIC	0.01MF		50V
C618	1-123-330-00	ELECT	22MF	20%	16V

FILTER

CF001	1-409-332-00	CERAMIC TRAP (4.5MHZ)
CF002	1-527-260-00	FILTER, CERAMIC (4.5MHZ)
CF003	1-409-332-00	CERAMIC TRAP (4.5MHZ)

CONNECTOR

CN001	♠:1-560-894-00	PIN, CONNECTOR 6P
CN002	♠:1-560-896-00	PIN, CONNECTOR 8P
CN003	♠:1-560-895-00	PIN, CONNECTOR 7P
CN004	♠:1-560-891-31	PIN, CONNECTOR 3P
CN501	♠:1-560-892-21	PIN, CONNECTOR 4P
CN502	♠:1-560-897-00	PIN, CONNECTOR 9P
CN503	♠:1-560-890-21	PIN, CONNECTOR 2P

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Ref.No.	Part No.	Description	Remark
CN504	●:1-560-893-00	PIN, CONNECTOR 5P	
CN601	●:1-560-893-41	PIN, CONNECTOR 5P	
CN602	●:1-560-891-00	PIN, CONNECTOR 3P	
CN603	●:1-560-890-00	PIN, CONNECTOR 2P	
		DIODE	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D007	8-719-911-19	DIODE 1SS119	
D008	8-719-911-19	DIODE 1SS119	
D009	8-719-911-19	DIODE 1SS119	
D401	8-719-911-19	DIODE 1SS119	
D402	⚠.8-719-100-67	DIODE RD13E-B1	
D403	8-719-911-19	DIODE 1SS119	
D404	8-719-911-19	DIODE 1SS119	
D405	8-719-911-19	DIODE 1SS119	
D406	8-719-911-19	DIODE 1SS119	
D407	8-719-911-19	DIODE 1SS119	
D408	8-719-911-19	DIODE 1SS119	
D409	8-719-911-19	DIODE 1SS119	
D410	8-719-911-19	DIODE 1SS119	
D411	8-719-911-19	DIODE 1SS119	
D412	8-719-911-19	DIODE 1SS119	
D413	8-719-911-19	DIODE 1SS119	
D414	8-719-911-19	DIODE 1SS119	
D415	8-719-911-19	DIODE 1SS119	
D417	8-719-911-19	DIODE 1SS119	
D419	8-719-911-19	DIODE 1SS119	
D421	8-719-911-19	DIODE 1SS119	
D423	8-719-100-67	DIODE RD13E-B1	
D425	8-719-911-19	DIODE 1SS119	
D427	8-719-911-19	DIODE 1SS119	
D429	8-719-911-19	DIODE 1SS119	
D501	8-719-9-1-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-758-852-00	IC CX885B	
IC002	8-759-157-40	IC UPC574J	
IC401	8-759-113-63	IC UPC1363C	
IC003	8-759-800-12	IC LA7920	
IC501	8-759-800-46	IC LA7046	
IC601	8-759-145-58	IC UPC4558C	
IC602	8-759-841-40	IC LA4140	
		COIL	
L001	1-408-591-31	MICRO INDUCTOR 1UH	
L002	1-408-597-00	MICRO INDUCTOR 3.3UH	
L003	1-408-608-11	MICRO INDUCTOR 2.7UH	
L004	1-408-603-11	MICRO INDUCTOR 10UH	
L005	1-408-602-11	MICRO INDUCTOR 8.2UH	
L006	1-408-604-11	MICRO INDUCTOR 12UH	
L007	1-408-606-11	MICRO INDUCTOR 18UH	
L008	1-408-611-11	MICRO INDUCTOR 47UH	
L009	1-407-716-00	MICRO INDUCTOR 820UH	
L401	1-408-609-00	MICRO INDUCTOR 1UH	
L402	1-408-609-00	MICRO INDUCTOR 33UH	
L403	1-408-612-00	MICRO INDUCTOR 56UH	
L501	1-407-718-00	MICRO INDUCTOR 1.2UH	
L502	1-407-508-00	MICRO INDUCTOR 22MMH	
L601	1-407-498-00	MICRO INDUCTOR 3.3MMH	
		VARIABLE COIL	
LV501	1-408-523-00	COIL, VARIABLE	
		VOLUME BLOCK	
PS001	1-230-125-12	VOLUME BLOCK, PRESET 14	
		TRANSISTOR	
Q001	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q002	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q003	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q004	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q007	8-769-193-09	TRANSISTOR 2SK43-3	
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q009	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q401	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q402	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q403	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q404	⚠.8-729-178-54	TRANSISTOR 2SC2785	
Q405	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q406	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q407	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q408	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q501	8-729-177-42	TRANSISTOR 2SD774	
Q502	8-729-194-57	TRANSISTOR 2SC945-P	
Q503	8-729-194-57	TRANSISTOR 2SC945-P	
Q504	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q505	8-729-204-83	TRANSISTOR 2SC2458-GR	
Q506	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q507	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q509	+8-729-245-83	TRANSISTOR 2SC2458-GR	
Q510	+8-729-245-83	TRANSISTOR 2SC2458-GR	
		RESISTOR	
R001	1-247-839-00	CARBON 2.2K 5% 1/6W	
R002	1-247-845-00	CARBON 3.9K 5% 1/6W	

NOTE:

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Ref.No.	Part No.	Description				Remark
R003	1-247-879-00	CARBON	100K	5%	1/6W	
R004	1-247-869-00	CARBON	39K	5%	1/6W	
R005	1-247-829-00	CARBON	820	5%	1/6W	
R006	1-247-799-00	CARBON	47	5%	1/6W	
R007	1-247-891-00	CARBON	330K	5%	1/6W	
R008	⚠.1-247-783-00	CARBON	100	5%	1/6W	F
R009	1-247-839-00	CARBON	2.2K	5%	1/6W	
R010	1-247-865-00	CARBON	27K	5%	1/6W	
R011	1-247-843-00	CARBON	3.3K	5%	1/6W	
R012	1-247-831-00	CARBON	1.0K	5%	1/6W	
R013	1-247-871-00	CARBON	47K	5%	1/6W	
R014	1-247-873-00	CARBON	56K	5%	1/6W	
R015	1-247-831-00	CARBON	1.0K	5%	1/6W	
R016	1-247-855-00	CARBON	10K	5%	1/6W	
R017	1-247-831-00	CARBON	1.0K	5%	1/6W	
R018	1-247-843-00	CARBON	3.3K	5%	1/6W	
R019	1-247-831-00	CARBON	1.0K	5%	1/6W	
R020	1-247-831-00	CARBON	1.0K	5%	1/6W	
R021	1-247-873-00	CARBON	56K	5%	1/6W	
R022	1-247-847-00	CARBON	4.7K	5%	1/6W	
R023	1-247-821-00	CARBON	390	5%	1/6W	
R024	1-247-821-00	CARBON	390	5%	1/6W	
R025	1-247-827-00	CARBON	680	5%	1/6W	
R026	1-247-847-00	CARBON	4.7K	5%	1/6W	
R027	1-247-817-00	CARBON	270	5%	1/6W	
R028	1-247-843-00	CARBON	3.3K	5%	1/6W	
R029	1-247-879-00	CARBON	100K	5%	1/6W	
R030	1-247-863-00	CARBON	22K	5%	1/6W	
R039	1-247-900-00	CARBON	750L	5%	1/6W	
R040	1-247-903-00	CARBON	1.0M	5%	1/6W	
R041	1-247-888-00	CARBON	240K	5%	1/6W	
R042	1-247-869-00	CARBON	39K	5%	1/6W	
R043	⚠.1-247-019-00	CARBON	2.2K	5%	1/6W	F
R044	1-202-735-00	SOLID	22M	10%	1/2W	
R045	1-247-879-00	CARBON	100K	5%	1/6W	
R047	1-247-879-00	CARBON	100K	5%	1/6W	
R050	1-247-871-00	CARBON	47K	5%	1/6W	
R051	1-247-871-00	CARBON	47K	5%	1/6W	
R070	1-247-843-00	CARBON	3.3K	5%	1/6W	
R402	1-247-855-00	CARBON	10K	5%	1/6W	
R403	1-247-855-00	CARBON	10K	5%	1/6W	
R404	1-247-855-00	CARBON	10K	5%	1/6W	
R405	1-247-883-00	CARBON	150K	5%	1/6W	
R406	1-247-879-00	CARBON	100K	5%	1/6W	
R407	1-247-881-00	CARBON	120K	5%	1/6W	
R408	1-247-879-00	CARBON	100K	5%	1/6W	
R409	1-247-855-00	CARBON	10K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R410	1-247-855-00	CARBON	10K	5%	1/6W	
R411	1-247-855-00	CARBON	10K	5%	1/6W	
R412	1-247-855-00	CARBON	10K	5%	1/6W	
R413	1-247-855-00	CARBON	10K	5%	1/6W	
R414	1-247-855-00	CARBON	10K	5%	1/6W	
R415	1-247-847-00	CARBON	4.7K	5%	1/6W	
R416	1-247-855-00	CARBON	10K	5%	1/6W	
R417	1-247-855-00	CARBON	10K	5%	1/6W	
R418	1-247-855-00	CARBON	10K	5%	1/6W	
R419	1-247-855-00	CARBON	10K	5%	1/6W	
R420	1-244-864-51	CARBON	430	5%	1/2W	
R421	1-247-891-00	CARBON	330K	5%	1/6W	
R422	1-247-875-00	CARBON	68K	5%	1/6W	
R423	1-247-855-00	CARBON	10K	5%	1/6W	
R424	1-247-855-00	CARBON	10K	5%	1/6W	
R425	1-247-855-00	CARBON	10K	5%	1/6W	
R426	1-247-855-00	CARBON	10K	5%	1/6W	
R501	1-247-859-00	CARBON	15K	5%	1/6W	
R502	1-247-859-00	CARBON	15K	5%	1/6W	
R503	1-247-783-00	CARBON	10	5%	1/6W	
R504	⚠.1-246-980-00	CARBON	3.3	5%	1/8W	F
R505	1-247-839-00	CARBON	2.2K	5%	1/6W	
R506	1-247-883-00	CARBON	150K	5%	1/6W	
R507	1-247-867-00	CARBON	33K	5%	1/6W	
R508	1-247-893-00	CARBON	390K	5%	1/6W	
R509	1-247-807-00	CARBON	100	5%	1/6W	
R510	1-247-839-00	CARBON	2.2K	5%	1/6W	
R511	1-247-839-00	CARBON	2.2K	5%	1/6W	
R512	1-247-903-00	CARBON	1.0M	5%	1/6W	
R513	1-247-863-00	CARBON	22K	5%	1/6W	
R514	1-247-849-00	CARBON	5.6K	5%	1/6W	
R515	1-247-855-00	CARBON	10K	5%	1/6W	
R516	1-247-865-00	CARBON	27K	5%	1/6W	
R517	1-247-847-00	CARBON	4.7K	5%	1/6W	
R518	1-247-855-00	CARBON	10K	5%	1/6W	
R519	1-247-869-00	CARBON	39K	5%	1/6W	
R520	1-247-843-00	CARBON	3.3K	5%	1/6W	
R521	1-247-855-00	CARBON	10K	5%	1/6W	
R522	1-247-839-00	CARBON	2.2K	5%	1/6W	
R523	1-247-871-00	CARBON	47K	5%	1/6W	
R524	1-247-855-00	CARBON	10K	5%	1/6W	
R525	1-247-867-00	CARBON	33K	5%	1/6W	
R527	1-247-847-00	CARBON	4.7K	5%	1/6W	
R528	1-247-831-00	CARBON	1.0K	5%	1/6W	
R529	1-247-783-00	CARBON	10	5%	1/6W	
R530	1-247-863-00	CARBON	22K	5%	1/6W	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description				Remark
R531	1-247-863-00	CARBON	22K	5%	1/6W	
R532	1-247-871-00	CARBON	47K	5%	1/6W	
R533	1-247-877-00	CARBON	82K	5%	1/6W	
R534	1-247-865-00	CARBON	27K	5%	1/6W	
R535	1-247-821-00	CARBON	390	5%	1/6W	
R536	1-247-844-00	CARBON	3.6K	5%	1/6W	
R537	1-247-815-00	CARBON	220	5%	1/6W	
R538	1-210-825-00	SOLID	3.3M	5%	1/4W	
R540	1-247-851-00	CARBON	6.8K	5%	1/6W	
R541	1-247-871-00	CARBON	47K	5%	1/6W	
R542	1-247-823-00	CARBON	47K	5%	1/6W	
R545 ⚠	1-212-869-00	FUSE	33	5%	1/4W	F
R546	1-247-863-00	CARBON	22K	5%	1/6W	
R601	1-247-799-00	CARBON	47	5%	1/6W	
R602	1-247-799-00	CARBON	47	5%	1/6W	
R603	1-247-839-00	CARBON	2.2K	5%	1/6W	
R604	1-247-839-00	CARBON	2.2K	5%	1/6W	
R605	1-247-823-00	CARBON	470	5%	1/6W	
R606	1-247-823-00	CARBON	470	5%	1/6W	
R607	1-247-879-00	CARBON	100K	5%	1/6W	
R608	1-247-879-00	CARBON	100K	5%	1/6W	
R609	1-247-879-00	CARBON	100K	5%	1/6W	
R610	1-247-879-00	CARBON	100K	5%	1/6W	
R611	1-247-867-00	CARBON	33K	5%	1/6W	
R612	1-247-799-00	CARBON	47	5%	1/6W	
R613	1-247-867-00	CARBON	33K	5%	1/6W	
R614	1-247-831-00	CARBON	1.0K	5%	1/6W	
R615	1-247-855-00	CARBON	10K	5%	1/6W	
R616	1-247-855-00	CARBON	10K	5%	1/6W	
R617	1-247-867-00	CARBON	33K	5%	1/6W	
R618	1-247-814-00	CARBON	200	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-747-00	RES, ADJ, CARBON 4.7K
RV002	1-228-747-00	RES, ADJ, CARBON 4.7K
RV501	1-224-256-XX	RES, ADJ, METAL GLAZE 220K
RV502	1-228-752-00	RES, ADJ, CARBON 220K
RV503	1-228-744-00	RES, ADJ, CARBON 470
RV504	1-228-744-00	RES, ADJ, CARBON 10K

SWITCH

S001	1-554-373-00	SWITCH, LEVER (AFT)

FILTER

SF001	1-404-227-51	SAWF

TRANSFORMER

Ref.No.	Part No.	Description	Remark
T001	1-404-153-00	VIFT	
T002	1-404-321-00	VIFT	
T003	1-404-352-00	VIFT	
T004	1-404-352-00	VIFT	
T005	1-404-411-00	SIF	
T501	1-433-237-00	TRANSFORMER, OSCILLATOR	

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

****

MISCELLANEOUS
****

Ref.No.	Part No.	Description	Remark
	♠:A-4910-021-A	R STATOR BOARD, COMPLETE (REEL MOTOR)	
	A-6761-056-A	ACE ASSY (AUDIO, AUDIO ERASE, CTL)	
	A-6765-128-A	COMMANDER ASSY (F)	
	X-2622-201-0	ROTOR ASSY, R (REEL MOTOR)	
	1-548-571-00	COUNTER, TAPE (MIDDLE TYPE)	
	1-551-644-41	CORD, CONNECTION	
⚠	1-551-964-00	CORD, POWER	
	8-825-508-10	HEAD, FE (FULL ERASE)	
	8-838-042-01	MOTOR, DC (BHF-1907A) (CAPSTAN MOTOR)	
L991	1-464-249-00	SENSOR, S COIL	
L992	1-464-250-00	SENSOR, T COIL	
M901	X-2621-202-2	ROTOR ASSY, D (DRUM MOTOR)	
	X-2621-204-2	STATOR ASSY, D (DRUM MOTOR)	
M904	A-6737-118-A	MOTOR ASSY, L (LOADING MOTOR)	
	1-541-163-00	MOTOR (LOADING MOTOR)	
MD001⚠	1-464-266-00	RF UNIT, COLOR (RFU-702)	
PM901⚠	A-6749-080-A	SOLENOID BLOCK ASSY (PINCH)	
⚠	1-454-349-00	SOLENOID, PLUNGER (PINCH)	
PM902⚠	1-454-348-00	SOLENOID, BRAKE PLUNGER	
S991	1-554-374-00	SWITCH, LEVER (CASSETTE IN)	
S992	1-554-374-00	SWITCH, LEVER (REC PROOF)	
S993	1-553-539-00	SWITCH, MICRO (THREADING END)	
S994	1-553-718-00	SWITCH, MICRO (UNTHREADING END)	
S996	1-554-372-21	SWITCH, ANTENNA CHANGE	
SP901	8-927-137-00	SPEAKER UNIT (030F010)	
T901 ⚠	1-447-676-00	TRANSFORMER, POWER	
TB991	1-417-092-00	DISTRIBUTOR, ANTENNA (UHF)	

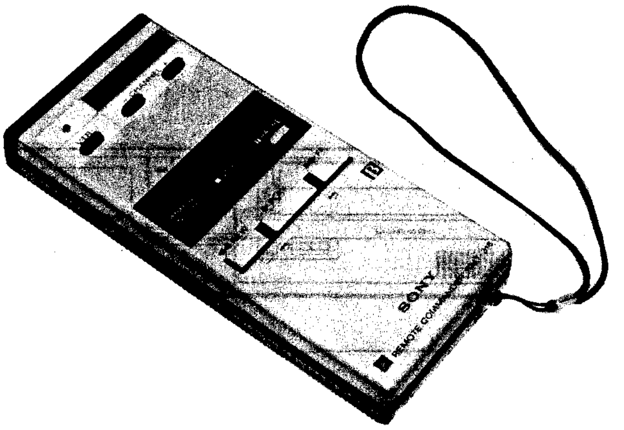
****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
A-6765-128-A	COMMANDER ASSY (F), RMT-316	
1-513-379-00	CONVERTER (EAC-25)	
1-551-644-41	CORD, CONNECTION	
1-556-971-00	WIRE ASSY, FEEDER	
3-671-402-00	INDICATOR, ACCESSORY	
3-671-873-03	CASE, ACCESSORY (SL-2410,SL-2415 US MODEL)	
3-671-873-04	CASE, ACCESSORY (SL2410 CANADIAN MODEL)	
3-674-317-00	LID, ACCESSORY CASE	
3-677-503-00	SHEET, PROTECTION	
3-679-326-00	CUSHION (UPPER)	
3-679-327-00	CUSHION (LOWER)	
3-681-963-00	INDIVIDUAL CARTON (SL-2410 US MODEL, CANADIAN MODLE)	
3-681-970-00	INDIVIDUAL CARTON (SL-2415 US MODEL)	
3-701-622-00	BAG, POLYETHYLENE	
3-701-630-00	BAG, POLYETHYLENE	
3-773-471-31	MANUAL, INSTRUCTION (SL-2410 CANADIAN MODEL)	
3-795-581-21	INSTRUCTION (SL-2410, SL-2415 US MODEL)	
4-491-335-21	CARD, WARRANTY (SL-2410,SL-2415 US MODEL)	
X-3793-021-0	PARTNER SHIP ASSY (SL-2410,SL-2415 US MODEL)	

RMT-316

SERVICE MANUAL

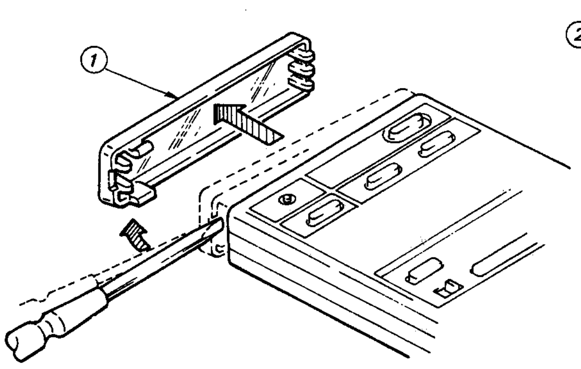


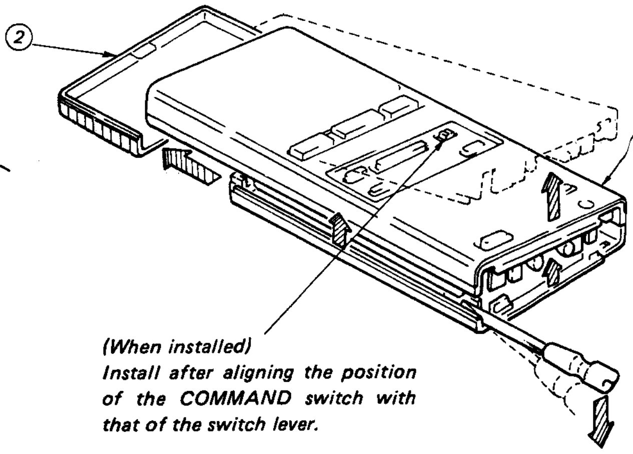
August, 1983

SPECIFICATIONS

Remote control system	Infrared control
Power requirements	3 V dc, 2 size AA batteries (IEC designation R6)
Dimensions	Approx. 65 × 20 × 153 mm (w/h/d) ($2^5/_8 \times {}^{13}/_{16} \times 6^1/_8$ inches)
Weight	Approx. 140 g (5 oz) incl. batteries

DISASSEMBLY





(When installed)
Install after aligning the position of the COMMAND switch with that of the switch lever.

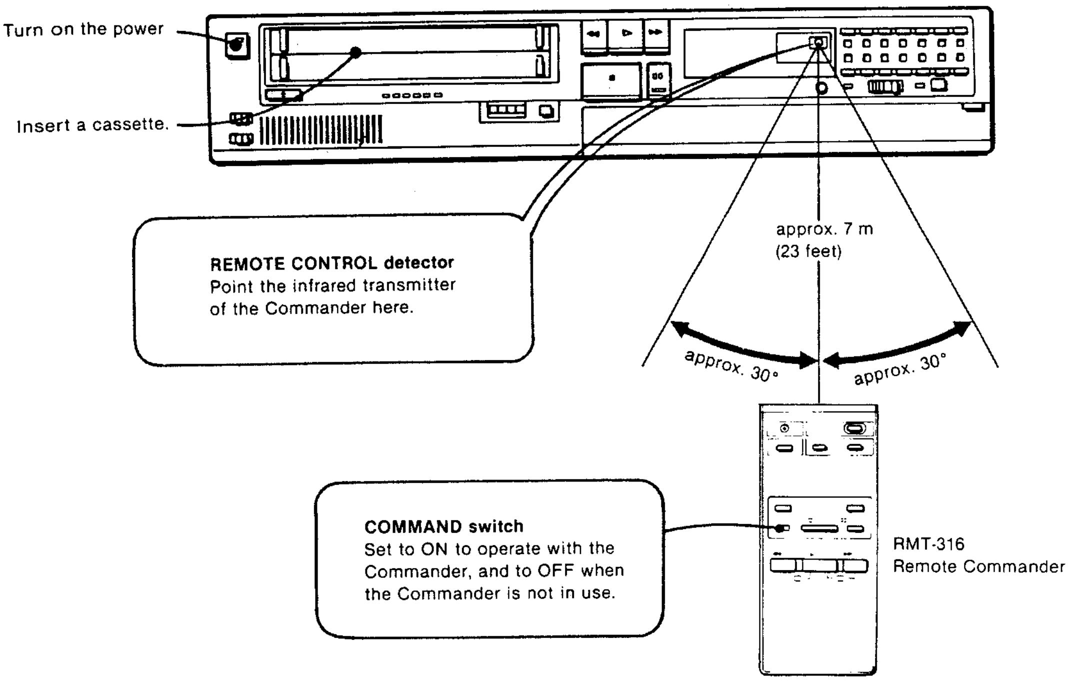
REMOTE COMMANDER
SONY®

1-1. FEATURE

This unit is a wireless remote control commander used for operating Sony's VTR SL-2410/2415 freely at a distant place.

1-2. REMOTE CONTROL OPERATION

You can control almost all of the functions of the video cassette recorder from your armchair using the supplied RMT-316 Remote Commander.


Turn on the power

Insert a cassette.

REMOTE CONTROL detector
Point the infrared transmitter of the Commander here.

approx. 7 m
(23 feet)

approx. 30°

approx. 30°

COMMAND switch
Set to ON to operate with the Commander, and to OFF when the Commander is not in use.

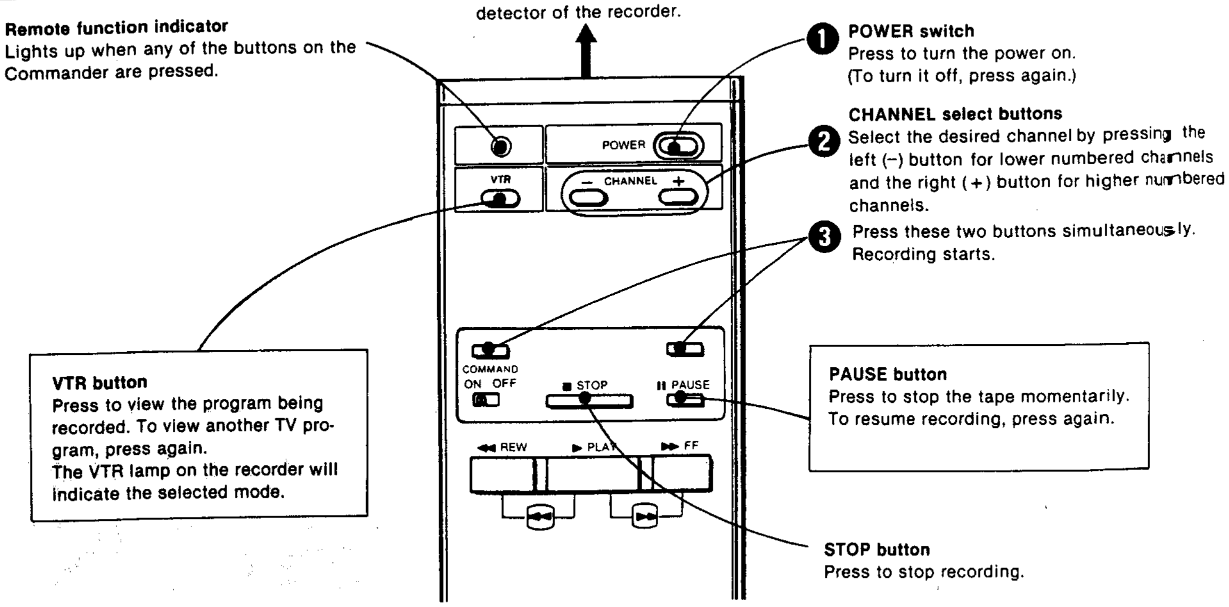
RMT-316
Remote Commander

- There should be no obstacles between the Commander and the remote control detector of the recorder.
- The shorter the distance between the Commander and the recorder, the wider the angle within which the recorder can be controlled.

Notes on the Commander

- Avoid dropping foreign objects into the cabinet, particularly when replacing batteries.
- Keep the unit away from extremely hot or humid places.
- Avoid mechanical shock to the unit.

RECORDING



Point toward the remote control detector of the recorder.

Remote function indicator
Lights up when any of the buttons on the Commander are pressed.

❶ **POWER switch**
Press to turn the power on.
(To turn it off, press again.)

❷ **CHANNEL select buttons**
Select the desired channel by pressing the left (–) button for lower numbered channels and the right (+) button for higher numbered channels.

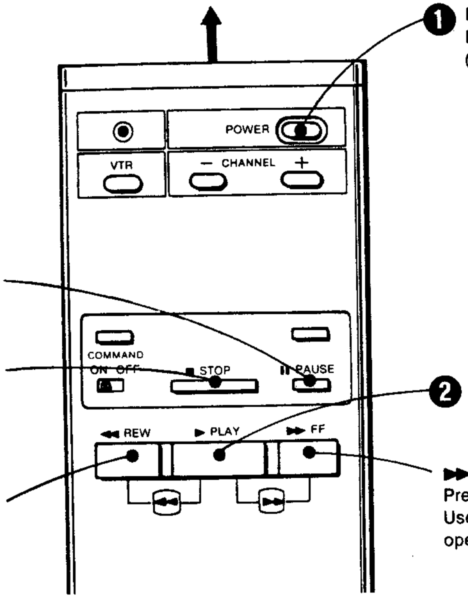
❸ Press these two buttons simultaneously.
Recording starts.

VTR button
Press to view the program being recorded. To view another TV program, press again.
The VTR lamp on the recorder will indicate the selected mode.

PAUSE button
Press to stop the tape momentarily.
To resume recording, press again.

STOP button
Press to stop recording.

PLAYBACK


POWER
VTR
— CHANNEL +
COMMAND
ON OFF
■ STOP
II PAUSE
◀◀ REW
▶ PLAY
▶▶ FF

Point toward the remote control detector of the recorder.

❶ **POWER switch**
Press to turn the power on.
(To turn it off, press again.)

PAUSE button
Press for a freeze picture.
Press again to resume normal speed playback.

STOP button
Press to stop the tape.

❷ Press. The playback begins.

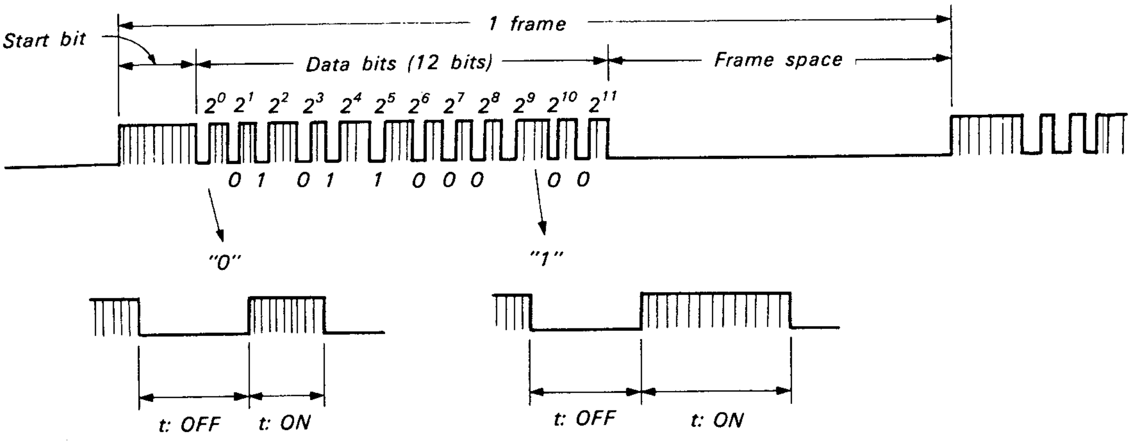
◀◀ REW button
Press to rewind the tape.
Use also for Betascan or Beta SkipScan operation in the reverse direction.

▶▶ FF button
Press to advance the tape rapidly.
Use also for Betascan or Beta SkipScan operation in the forward direction.

1-3. REMOTE CONTROL SIGNAL

As shown in the figure below, one frame of the signal consists of a start bit and data bits (12 bits), which are periodically repeated.
"0" and "1" of each data bit are discriminated by a length of t: ON time.
The example shown below gives 001011000100 if read from the position of a bit 2^0.

The time definition is shown in the table below.


Start bit
1 frame
Data bits (12 bits)
Frame space
2^0 2^1 2^2 2^3 2^4 2^5 2^6 2^7 2^8 2^9 2^{10} 2^{11}
0 1 0 1 1 0 0 0 0 0
"0"
"1"
t: OFF
t: ON
t: OFF
t: ON

		Time	Deviation
Start bit		2.4 ms	± 0.1 ms
Data "0"	**t: OFF**	0.6 ms	± 0.1 ms
	t: ON	0.6 ms	± 0.1 ms
Data "1"	**t: OFF**	0.6 ms	± 0.1ms
	t: ON	1.2 ms	± 0.1 ms
1 frame		45 ms	± 0.1 ms
Carrier		40 kHz	± 200 Hz

Assignment table of remote control code

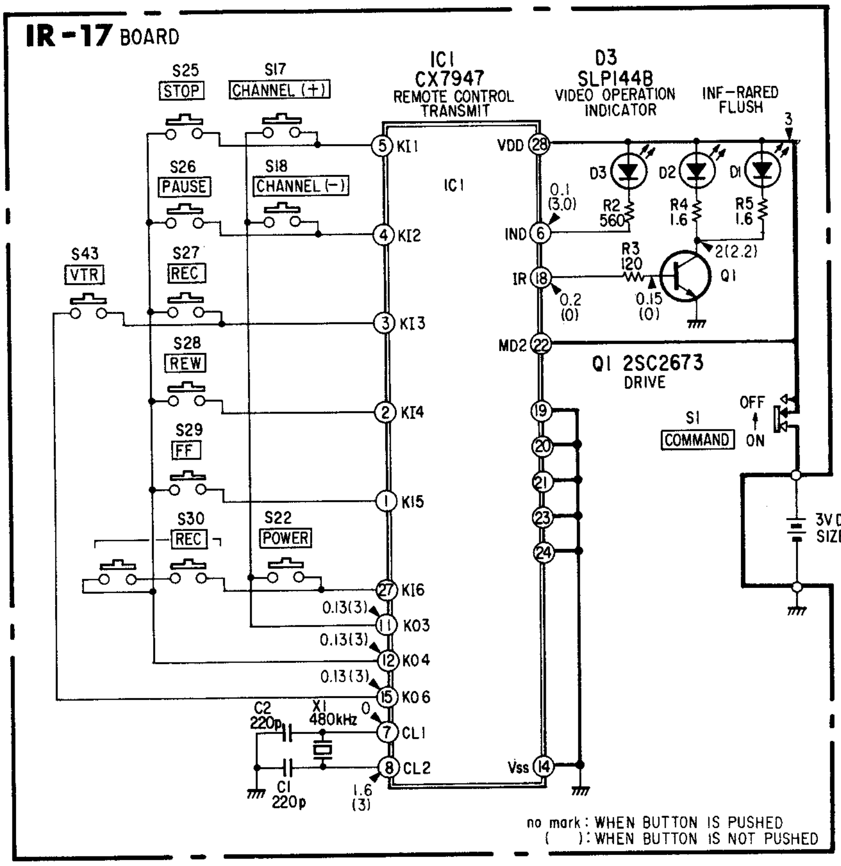
SW No.	Input signal	Data code							Category code				
		2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9	2^{10}	2^{11}
17	CHANNEL UP	0	0	0	0	1	0	0	0	1	0	0	0
18	CHANNEL DOWN	1	0	0	0	1	0	0	0	1	0	0	0
22	POWER	1	0	1	0	1	0	0	0	1	0	0	0
25	STOP ■	0	0	0	1	1	0	0	0	1	0	0	0
26	PAUSE ❚❚	1	0	0	1	1	0	0	0	1	0	0	0
27	PB ▶	0	1	0	1	1	0	0	0	1	0	0	0
28	REW ◀◀	1	1	0	1	1	0	0	0	1	0	0	0
29	FF ▶▶	0	0	1	1	1	0	0	0	1	0	0	0
30	REC ●	1	0	1	1	1	0	0	0	1	0	0	0
43	TV/VTR	0	1	0	1	0	1	0	0	1	0	0	0

Voltage value of IC1 Unit: V

	5	4	3	2	1	27
Channel Up	0.13					
Channel Down		0.13				
POWER						0.13
STOP ■	0.13					
PAUSE ❚❚		0.13				
PB ▶			0.13			
REW ◀◀				0.13		
FF ▶▶					0.13	
REC ●						0.13
TV/VTR			0.13			

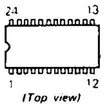
(The voltage value is 0V, unless otherwise specified.)

2. DIAGRAMS

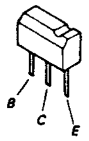

IR-17 BOARD
S25 STOP
S17 CHANNEL (+)
S26 PAUSE
S18 CHANNEL (−)
S43 VTR
S27 REC
S28 REW
S29 FF
S30 REC
S22 POWER
IC1 CX7947 REMOTE CONTROL TRANSMIT
D3 SLP144B VIDEO OPERATION INDICATOR
INF-RARED FLUSH
KI1
KI2
KI3
KI4
KI5
KI6
KO3
KO4
KO6
CL1
CL2
VDD
IND
IR
MD2
Vss
0.13(3)
0
1.6 (3)
C2 220p
C1 220p
X1 480kHz
D3
D2
D1
0.1 (3.0)
R2 560
R4 1.6
R5 1.6
R3 120
2(2.2)
0.2 (0)
0.15 (0)
Q1
Q1 2SC2673 DRIVE
S1 COMMAND
OFF
ON
3V DC SIZE "AA"
no mark : WHEN BUTTON IS PUSHED
( ) : WHEN BUTTON IS NOT PUSHED

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.

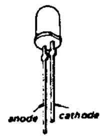
CX7947


24
13
1
12
(Top view)

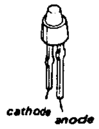
2SC2673



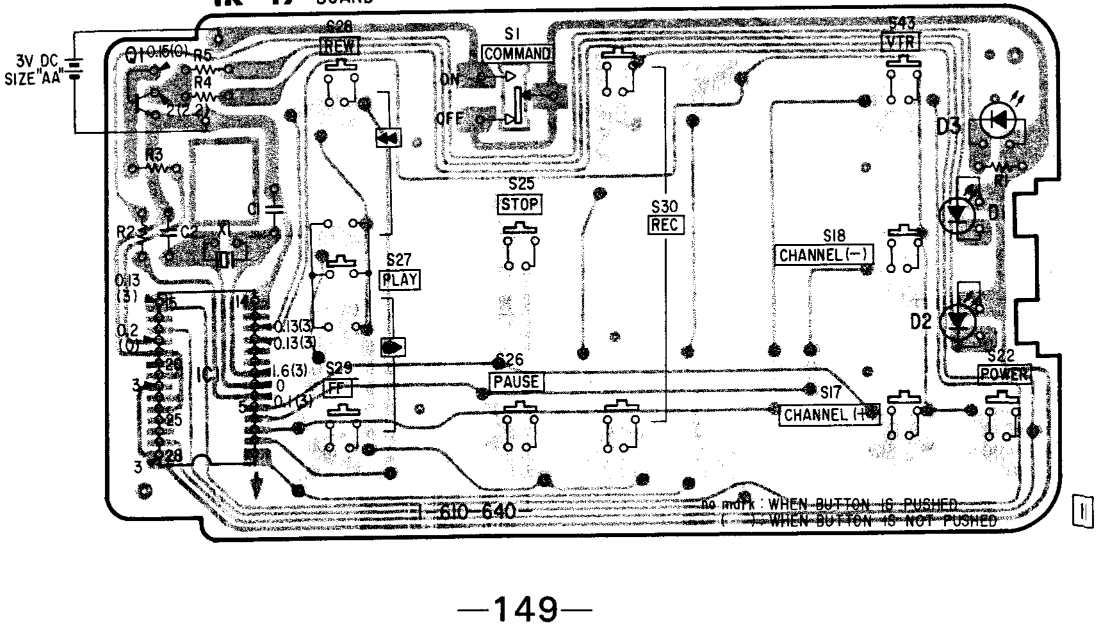
SE303AX


anode
cathode

SLP144B


cathode
anode

IR-17 BOARD


3V DC SIZE "AA"
Q1
0.15(0)
R5
R4
2(2.2)
R3
R2
C2
C1
X1
0.13 (3)
0.2 (0)
15
14
IC1
25
28
3
0.13(3)
0.13(3)
1.6(3)
0
0.13(3)
S28 REW
S1 COMMAND
ON
OFF
S43 VTR
S25 STOP
S30 REC
S18 CHANNEL (−)
S27 PLAY
S29 FF
S26 PAUSE
S17 CHANNEL (+)
S22 POWER
D3
D1
D2
1-610-640
no mark : WHEN BUTTON IS PUSHED
( ) : WHEN BUTTON IS NOT PUSHED
11

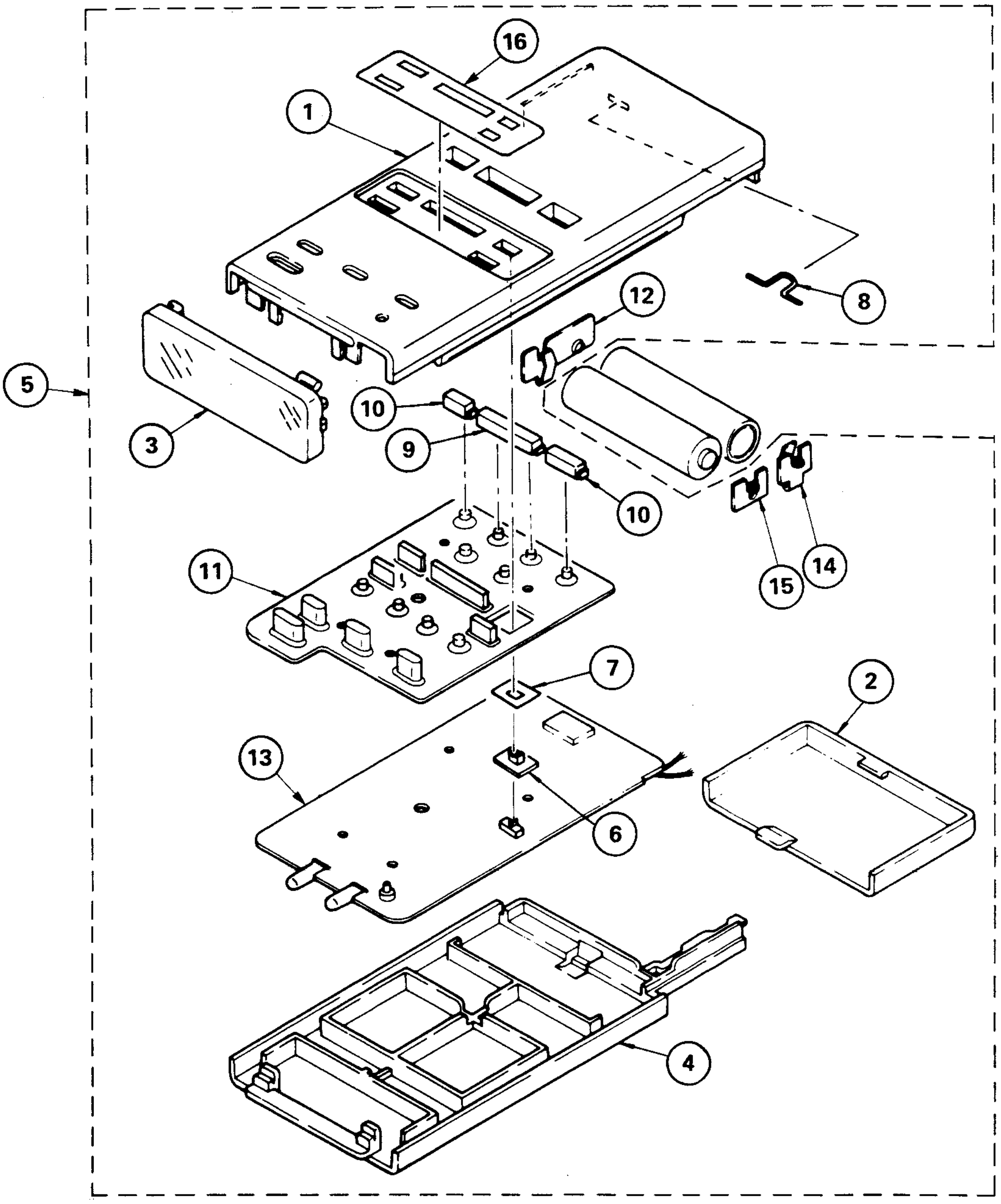
3. EXPLODED VIEWS

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked " ♠ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



No.	Part No.	Description	Remark
1	X-2290-609-0	CASING ASSY (F)	
2	2-290-606-00	COVER, BATTERY	
3	2-290-608-00	PLATE, FROSTED	
4	2-290-611-00	CASE, LOWER	
5	A-6765-128-A	COMMANDER ASSY (F), RMT-316	1-4,6-16
6	2-290-628-00	KNOB, SLIDE	
7	2-290-629-00	PLATE, COLOR	
8	♠:2-290-630-00	STOPPER, HOLDER	
9	2-290-632-00	PUSH BUTTON (L)	
10	2-290-633-00	PUSH BUTTON (M)	
11	2-290-645-00	RUBBER (C), CONTACT	
12	4-350-925-00	TERMINAL (C), BATTERY	
13	♠:1-610-640-00	IR-17 BOARD	
14	2-290-601-00	TERMINAL (A), BATTERY	
15	2-290-602-00	TERMINAL (B), BATTERY	
16	2-290-627-11	LABEL (B)	

4. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No.	Part No.	Description				Remark
	♦:1-610-640-00	IR-17 BOARD ***********				
	2-290-601-00	TERMINAL (A), BATTERY				
	2-290-602-00	TERMINAL (B), BATTERY				
		CAPACITOR				
C1	1-102-110-00	CERAMIC	220PF	10%	50V	
C2	1-102-110-00	CERAMIC	220PF	10%	50V	
		DIODE				
D1	=>8-719-107-82	DIODE SE303AY				
D2	=>8-719-107-82	DIODE SE303AY				
D3	8-719-901-44	DIODE SLP144B				
		IC				
IC1	8-759-902-22	IC CX7947				
		TRANSISTOR				
Q1	8-729-967-32	TRANSISTOR 2SC2673				
		RESISTOR				
R2	1-247-825-00	CARBON	560	5%	1/6W	
R3	1-247-809-00	CARBON	120	5%	1/6W	
R4	1-246-406-00	CARBON	1.6	5%	1/4W	
R5	1-246-406-00	CARBON	1.6	5%	1/4W	
		SWITCH				
SW1	1-553-977-31	SWITCH, SLIDE				
		CRYSTAL				
X1	1-527-476-00	OSCILLATOR, CERAMIC				

****

ACCESSORIES AND PACKING MATERIALS

****

Part No.	Description	Remark
3-701-622-00	BAG, POLYETHYLENE	
4-352-958-00	STRAP, HAND	

SL-2410/2415

Norh.

SONY®

SERVICE MANUAL

US Model
Canadian Model
PX Model

February, 1984

SUPPLEMENT-2

Subject: Circuit Operation

Except for the timer reservation, tuning, and speech synthesis circuits, the circuit configuration of SL-2410/2415 is nearly the same as that of SL-2400. Refer to the circuit and instruction manual for SL-2400 for circuits other than these three. (SL-2400 SERIES OPERATION MANUAL PART NO. 9-972-230-31)

MICROFILM

Consumer
VIDEO

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1. GENERAL

Model SL-2410/2415 has been designed based on the SL-2400 and both models have a large number of circuit configurations in common. The timer reservation, tuning, and speech synthesis circuits of SL-2410/2415 have large differences from those of SL-2400.

Except for these three circuits, the circuit configurations of these two models are nearly the same.

The descriptions in this manual center on the timer reservation, tuning, and speech synthesis circuits of SL-2410/2415.

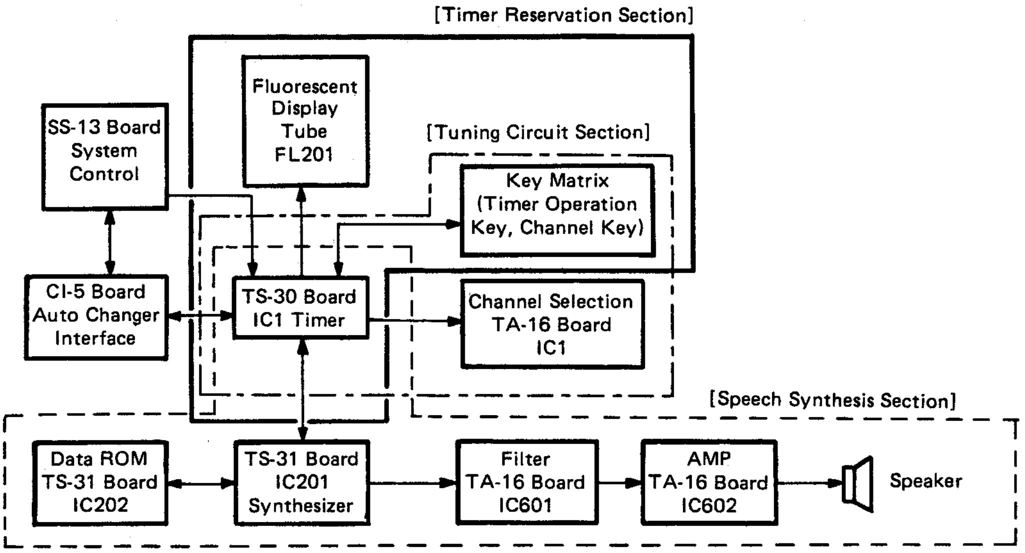

[Timer Reservation Section]
Fluorescent Display Tube FL201
SS-13 Board System Control
[Tuning Circuit Section]
Key Matrix (Timer Operation Key, Channel Key)
CI-5 Board Auto Changer Interface
TS-30 Board IC1 Timer
Channel Selection TA-16 Board IC1
[Speech Synthesis Section]
Data ROM TS-31 Board IC202
TS-31 Board IC201 Synthesizer
Filter TA-16 Board IC601
AMP TA-16 Board IC602
Speaker

Fig. 1-1 Block Diagram

2. TIMER RESERVATION SECTION

2-1. Power Supplies

IC1 on the TS-30 Board is a C-MOS IC and is driven by a single 5V. As the timer +B power supply, +5V is fed to pins ㉖ and (58) of IC1.

The fluorescent display tube is directly driven by the output of IC1, and −25V is fed to pin (51) for biasing. The IC for the speech synthesis circuit on the TS-31 Board connected to the timer reservation IC operates on 9V.

As the timer reservation and speech synthesis ICs process signals bidirectionally through the I/O ports, data cannot be transferred if the drive voltages differ. The 9V power is obtained by providing a −4V line for the speech synthesis IC using +5V as reference and combining the +5 and −4V power supplies.

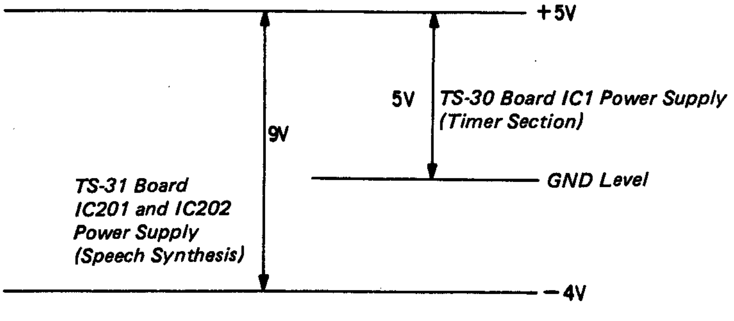

+5V
5V
TS-30 Board IC1 Power Supply (Timer Section)
9V
GND Level
TS-31 Board IC201 and IC202 Power Supply (Speech Synthesis)
−4V

Fig. 2-1 Power Supply

Using this power supply configuration, signals are exchanged between IC1 on the TS-30 Board and ICs 201 and 202 on the TS-31 Board.

The high level (+5V) output from IC1 on the TS-30 Board corresponds to the 9V input for IC201 on the TS-31 Board.

The power for the timer is a +5V line, divided into two systems, TIMER +5V and EVER +5V. The TIMER +5V line is the power line for memory back-up in case of a power failure.

This is because the power consumption of ICs 201 and 202 on the TS-31 Board for speech synthesis is large, and IC1 on the TS-30 Board only is backed up in case of a power failure.

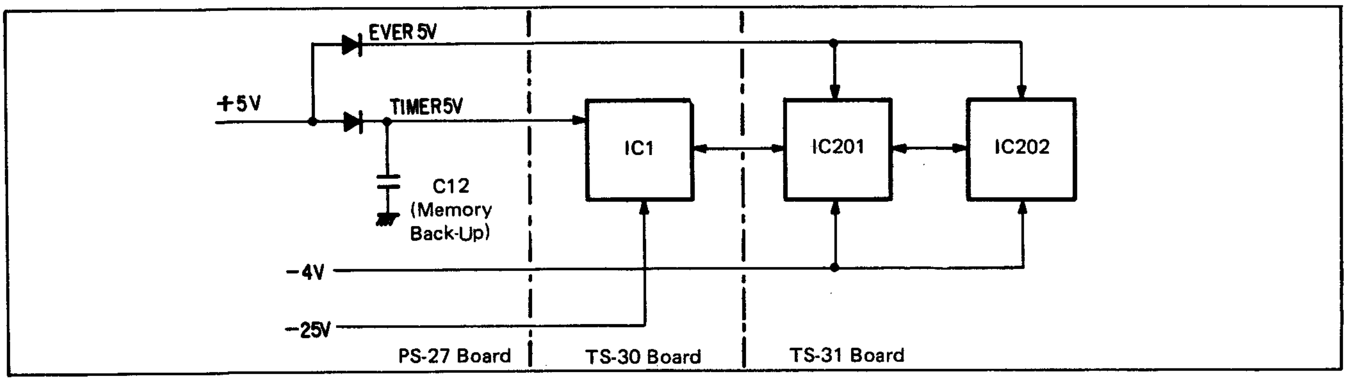


Fig. 2-2 Power Supply Block Diagram

2-2. IC μPD7519G for Timer Control

The input and output signals for IC1 (μPD7519G) on the TS-30 Board, which forms the core of the timer reservation circuit, are described next.

μPD7519G is driven by a quartz oscillator at a fundamental clock frequency of 4.19MHz. Power supply frequency synchronization is used as the clock. In a power failure, the internal 4.19MHz clock takes over. The back-up time for a power failure is approximately five minutes.

Input Signals

Pin No.	Signal Name	Function	Signal Condition
②	POWER SW SENS	Detects when POWER SW is pressed	_⌐‾→ (While POWER SW is pressed)
⑤	PAUSE	Detects PAUSE condition	_⌐‾→ (PAUSE)
⑥	REC READY {REC MODE}	Detects REC condition	_⌐‾→ (REC)
⑦	POWER ON/OFF	Detects when power is supplied to the set	_⌐‾→ (POWER ON)
⑧	CASSETTE IN	Detects when cassette is loaded	_⌐‾→ (Cassette is loaded)
⑨	REC PROOF	Detects when cassette tab is present	_⌐‾→ (No cassette click)
⑩ ⑪ ⑫ ⑬	Key Matrix Input		
⑭	$\overline{\text{CH UP}}$	CHANNEL UP input by remote control	‾|_|‾→
⑮	$\overline{\text{CH DOWN}}$	CHANNEL DOWN input by remote control	‾|_|‾→
⑯	TMR POSITION	Detects when the TIMER REC SW is pressed	_⌐‾→ (TIMER REC SW ON)
⑰	AC REF	AC reference input (reference clock input)	⎍⎍⎍⎍→ (50/60Hz)
(57)	REC SW	Detects when REC SW is pressed	_⌐‾→ (REC SW ON)
(63)	RESET		_/‾_→

Output Signals

Pin No.	Signal Name	Function	Signal Condition
⑱	CTL1	Speech synthesis control signals (4 bits)	
⑲	CTL2		
⑳	CTL4		
㉑	CTL8		
㉗ ~ ㉞	Display Segment Output		
㉟ ~ ㊷	Key Matrix Output		
㊹ ~ ㊿	Display Grid Output		
(53)	PDC	Speech synthesis data transfer clock	
(55)	TIMER OUT	Timer ON output	_⌐‾→ (Timer ON)
(59)	CH-UP	CHANNEL UP output	_|‾|_→
(60)	CH-DOWN	CHANNEL DOWN output	_|‾|_→
(62)	CH LAMP CONT	Channel display control output	_⌐‾→ (Channel lamp ON)

Table 2-1 Functions of IC1 Input and Output Signals

2-3. Reset Circuit

The timer reset circuit operates when plugging the AC plug into a socket. The reset circuit comprises Q1, Q2, Q3 and D2 on the TS-30 Board.

A current flows in D2 through R10 when 5V is fed to the timer +B power supply, generating a voltage of approximately 1.7V on the anode side of D2. D2 is an LED, and its VF (forward voltage) is approximately 1.7V and is stable.

The base voltage of Q3 is held at approximately 1.7V. This holds the Q3 emitter voltage at approximately 1.1V. C2 is fed with the Q2 base voltage, and there is a delay needed for voltage to rise. Q2 cuts off when the Q2 base voltage reaches approximately 1.7V, and Q3 switches on.

Q1 base current flows when Q3 switches on, and the Q1 collector voltage becomes approximately 5V.

The Q2 base voltage is divided in R4 and R6 and finally rises to approximately 2.6V. The Q2 emitter voltage also increases to cut off Q3 as the Q3 emitter voltage finally rises above approximately 1.1V. Q1 is switched OFF, and the Q1 collector voltage suddenly drops. Thus, one reset pulse is output from the Q1 collector.

C5 connected across the output side is for noise suppression.

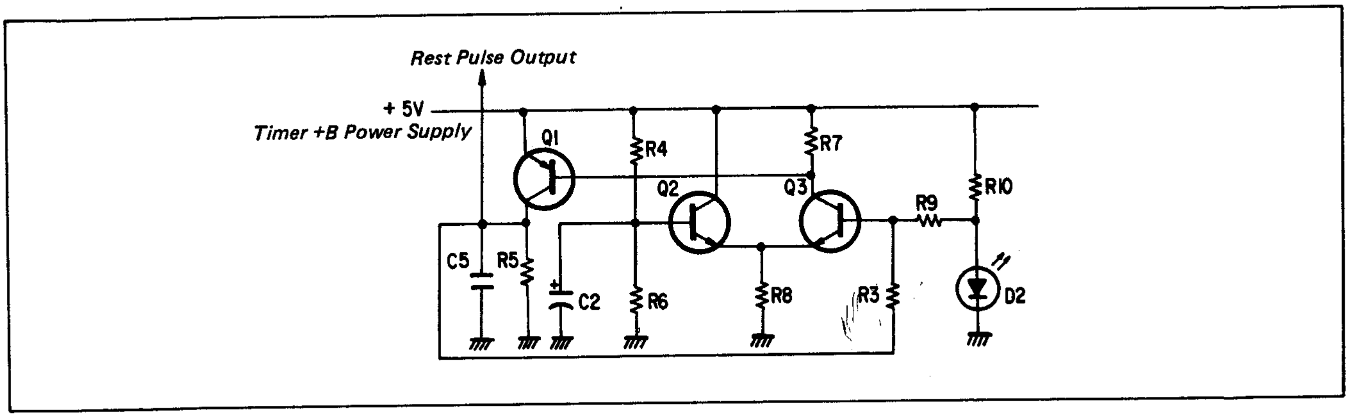


Fig. 2-3 Reset Circuit

3. TUNING CIRCUIT

Channel is selected by remote control or by directly operating the channel buttons on the main unit. The two tuning systems differ in the microcomputer input system. When tuning directly with the channel buttons on the video deck, IC1 on the TS-30 Board detects which of the 14 keys has been pressed by scanning keys A to N in the key matrix.

IC1 outputs a tuning signal to IC401 on the TA-16 Board for channel selection when a key between A and N is pressed. This tuning method differs from the conventional method.

Instead of directly designating the channel when a key is pressed, channel selection is performed using CHANNEL UP and DOWN pulses.

The tuning circuit in SL-2410/2415 consists of IC401 (μPC1363C) on the TA-16 Board, and the CHANNEL UP and DOWN terminals of IC401 are used for channel selection.

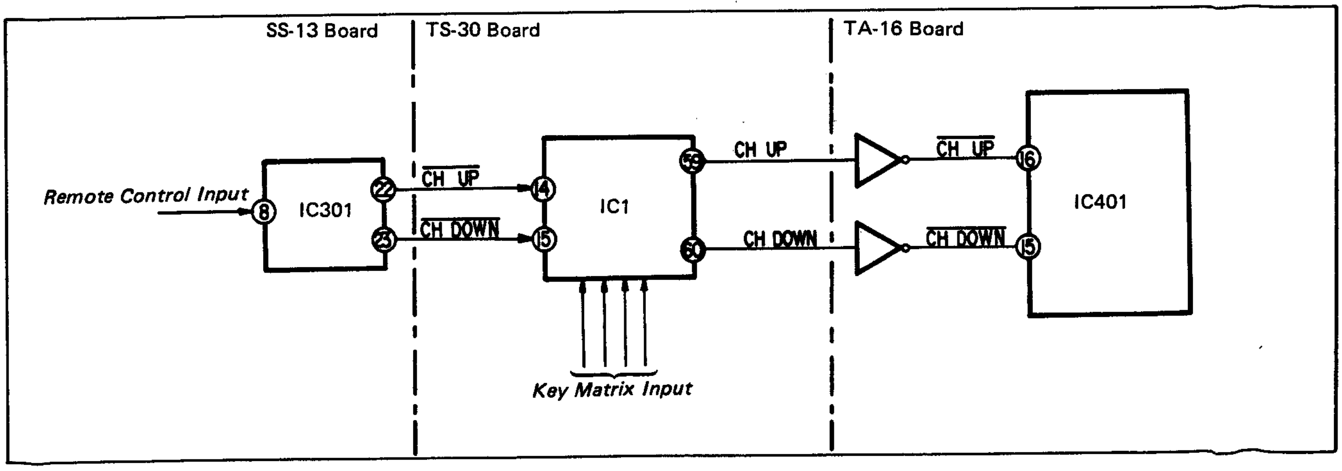


Fig. 3-1 Tuning Section Block Diagram

(1) Initialization of the channel memory when the power is switched on (preset to Channel A).
Initialization is performed by changing the levels of both pins ⑮ and ⑯ from "H" to "L", and to "H" again. Channel A is preset.

Or SL-2410/2415, setting once returns to Channel A no matter which channel key is pressed, and the designated channel is set. The following signals are input to pins ⑯ ($\overline{\text{CH UP}}$, channel up input) and ⑮ ($\overline{\text{CH DOWN}}$, channel down input) of IC401 on the TA-16 Board).

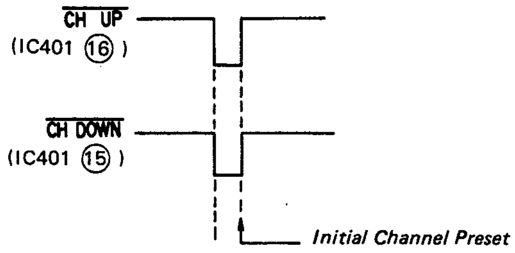

CH UP
(IC401 ⑯)
CH DOWN
(IC401 ⑮)
Initial Channel Preset

Fig. 3-2 Initialization Timing Chart

(2) Tuning when a channel key between A and N is pressed:
When a channel key between A and N is pressed, Channel A is first reset, and pulses of number corresponding to the designated channel are sent (taking Channel A as zero, Channel C will be two pulses).

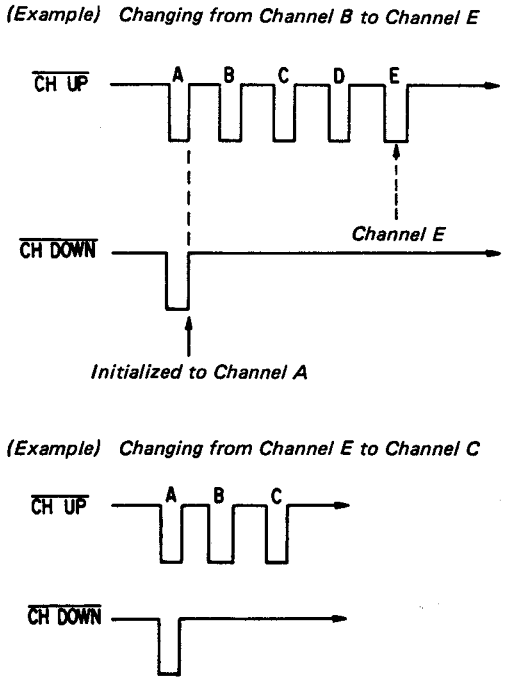

(Example) Changing from Channel B to Channel E
CH UP
A
B
C
D
E
Channel E
CH DOWN
Initialized to Channel A
(Example) Changing from Channel E to Channel C
CH UP
A
B
C
CH DOWN

Fig. 3-3 Tuning Timing Chart

(3) When UP/DOWN is input from remote control
$\overline{\text{CH UP}}$ and $\overline{\text{CH DOWN}}$ signals from the SS-13 Board are input to pins ⑭ and ⑮ of IC1 on the TS-30 Board. IC1 processes these signals and translates them for output as described here:

As an example, assume that the video channel is set to Channel 3 (C). When the remote control unit sends a CHANNEL UP signal, IC1 decides the result as 3 + 1 = 4.

The signal output from IC1 then returns the channel to Channel 1 (A) (initialization) and three CHANNEL UP pulses are output; the result is the same as if the Channel 4 (D) key on the video main unit had been pressed.

The entire process may seem redundant. However, returning the channel to the initial state ensures that it operates accurately even when the first pulses are mis-counted, providing protection against mis-selection due to external noise.

The output format is the same when tuning directly or by remote control. Setting returns once to the initial Channel A and pulses corresponding to the designated channel are output.

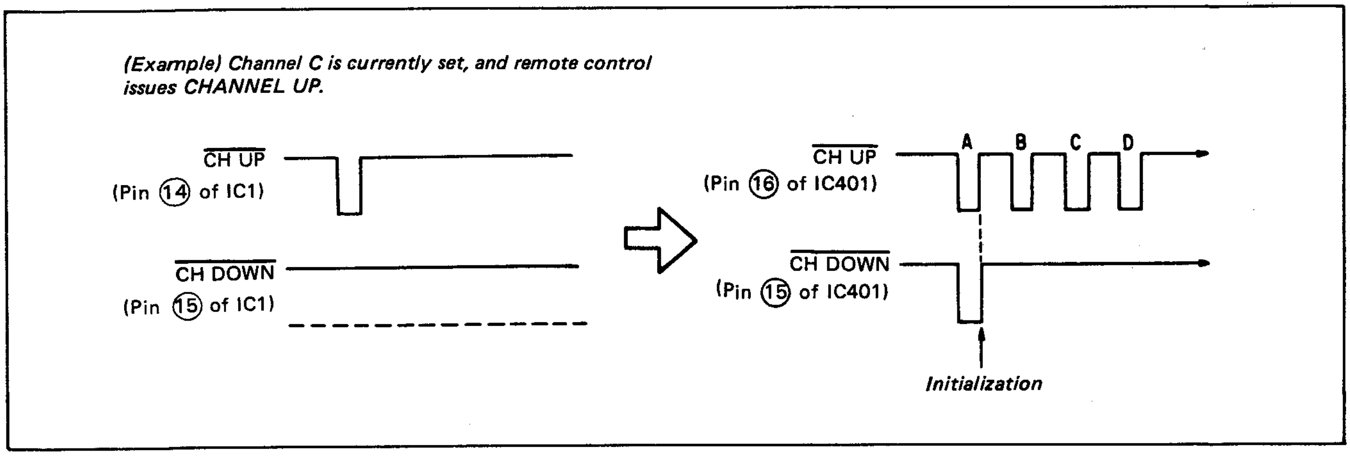


Fig. 3-4 Remote Control Tuning Timing Chart

4. TUNER

SL-2410/2415 uses a BT-866 tuner which can receive both CATV mid- and super-bands. LA7920 (IC003) selects the tuner receiving band. The tIC, μPC1363C (IC401), permits channel selection by remote control.

4-1. Signal System

The signal system of SL-2410/2415 is the same as that of SL-2400 except that the tuner has been changed to BT-866.

4-2. Channel Selection

UIC401 μPD1363C changes the channel. This IC selects channels by making the corresponding pin (Example: Pin ④ when tuning Channel (A) "L" by the channel selection signals (CH UP and CH DN) sent IC1 on the TS-30 Board.

4-3. Band Selection

The band selection switch is inside the preset block PS-001A. This switch outputs three signals, VL, VH, and U. These three signals are converted into two signals, B1 and B2 in Q008 and Q009 and are input to IC003. IC003 produces four band selection signals, L, M, H, and U, for the BT-866 tuner. (See Table 4-1 and Fig. 4-1.)

Signal / Receiving Band	VL	VH	U	B1	B2	L	M	H	U
VL	L	H	H	H	L	H	L	L	L
M	H	H	H	L	L	H	H	L	L
VH·S	H	L	H	L	H	H	H	H	L
U	H	H	L	H	H	L	L	L	H

Table 4-1

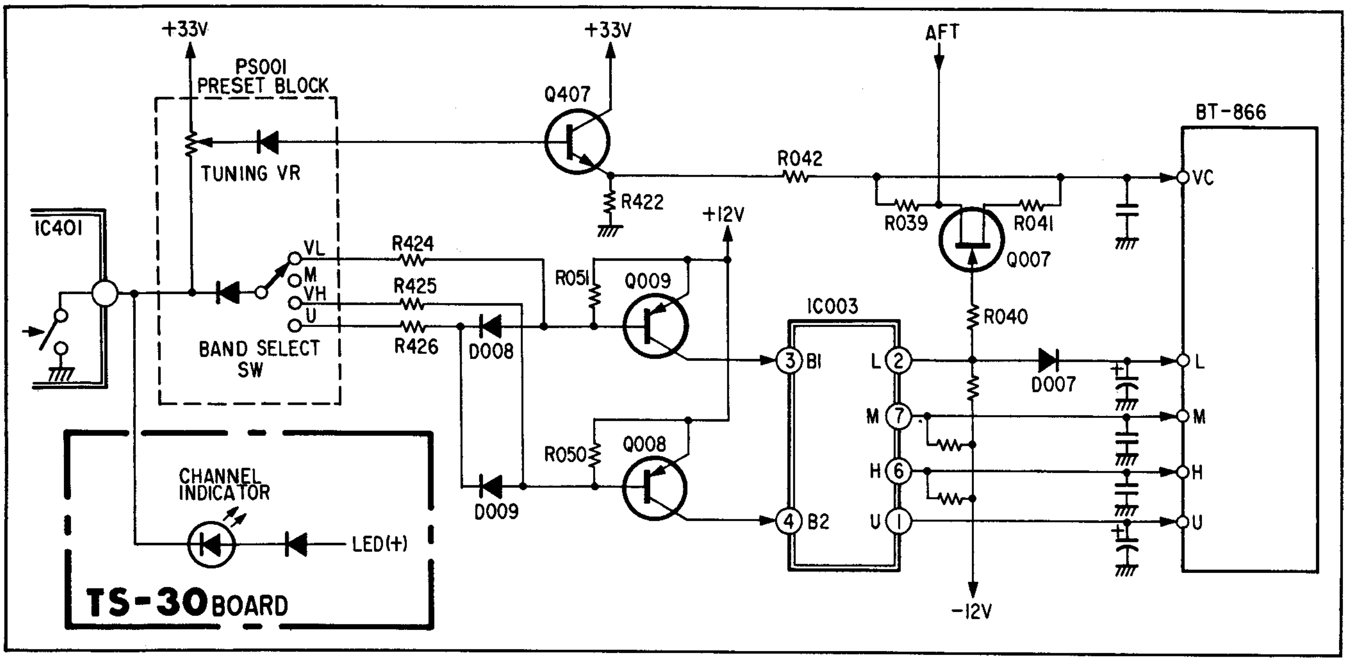

+33V
PS001
PRESET BLOCK
TUNING VR
IC401
VL
M
VH
U
BAND SELECT
SW
R424
R425
R426
D008
+33V
Q407
R422
+12V
R051
Q009
R050
Q008
D009
CHANNEL
INDICATOR
LED(+)
TS-30 BOARD
AFT
R042
R039
R041
Q007
R040
IC003
3 B1
4 B2
L 2
M 7
H 6
U 1
D007
-12V
BT-866
VC
L
M
H
U

Fig. 4-1

4-4. Defeat Signal

A defeat signal is output from pin ⑬ of IC004 when AFT defeat and speech signal muting is selected for the channel.

Pin ⑬ (defeat) of IC401 is normally "H". However, the level changes to "L" during channel selection. This switches Q401 on, and the level at Q401 collector changes to "H". Then this voltage is input to pin ⑧ of IC001 through D004 and R017 to stop the AFT operation.

This voltage is applied to the Q002 base through R029 and D003 to switch on Q002 for speech signal muting. The voltage is also input to Q405 base through R423 to extinguish channel display.

R405 and C406 connected to Q401 base switch on Q401 for speech muting and other functions during the rise of EVER power.

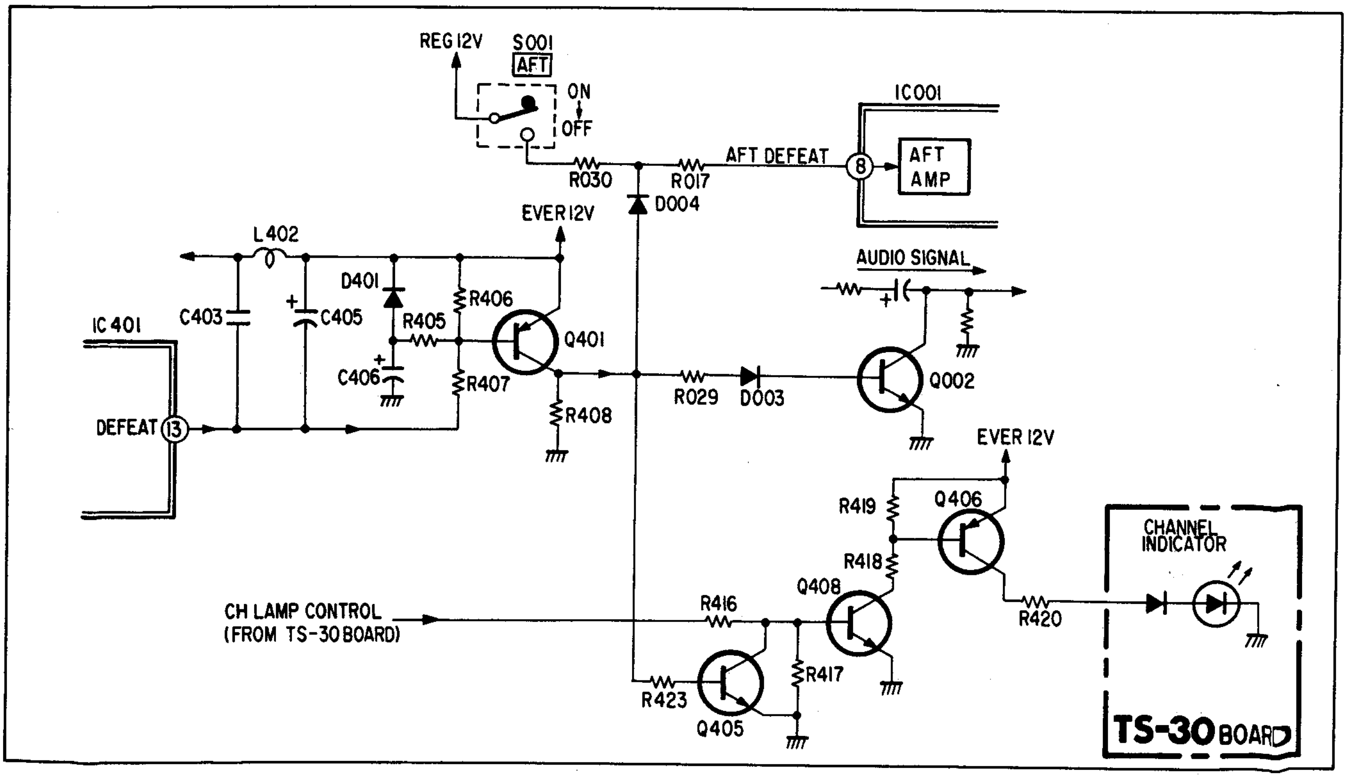

REG 12V
S001
AFT
ON
OFF
R030
R017
AFT DEFEAT
IC001
8
AFT
AMP
EVER 12V
D004
L402
D401
R406
R405
Q401
C403
C405
C406
R407
R408
IC 401
DEFEAT 13
R029
D003
AUDIO SIGNAL
Q002
EVER 12V
R419
Q406
R418
Q408
R416
R420
R417
R423
Q405
CH LAMP CONTROL
(FROM TS-30 BOARD)
CHANNEL
INDICATOR
TS-30 BOARD

Fig. 4-2

5. SPEECH SYNTHESIS CIRCUIT

5-1. Speech Synthesis Circuit Configuration

The speech synthesis circuit is composed of IC1 on the TS-30 Board, IC201 (synthesizer) and IC202 (speech data ROM) on the TS-31 Board, and IC601 (filter) and IC602 (power amplifier) on the TA-16 Board.

IC1 on the TS-30 Board controls when the corresponding words are output. IC201 has a five-line control bus; PDS (processor data clock), CTTL1, CTL2, CTL4, and CTL8. Lines CTL1, 2, 4 and 8 are a bi-directional bus which transfers command (instruction) signals and data between the control side (IC1 on TS-30 Board) and IC201. The PDC clock synchronizes signal and data transfer.

Commands from IC1 to IC201 are transferred in a four-bit pattern on the four line CTL bus with PDS pulses. IC201 is clocked at 640kHz by ceramic oscillator CF201, and a signal multiplied by ¼ in IC201 is transferred to IC202 as the ROM clock.

ICs 201 and 202 are connected by a four-line address/data bus, ADD1, ADD2, ADD4, and ADD8, and Iφ and I1, which are control-lines.

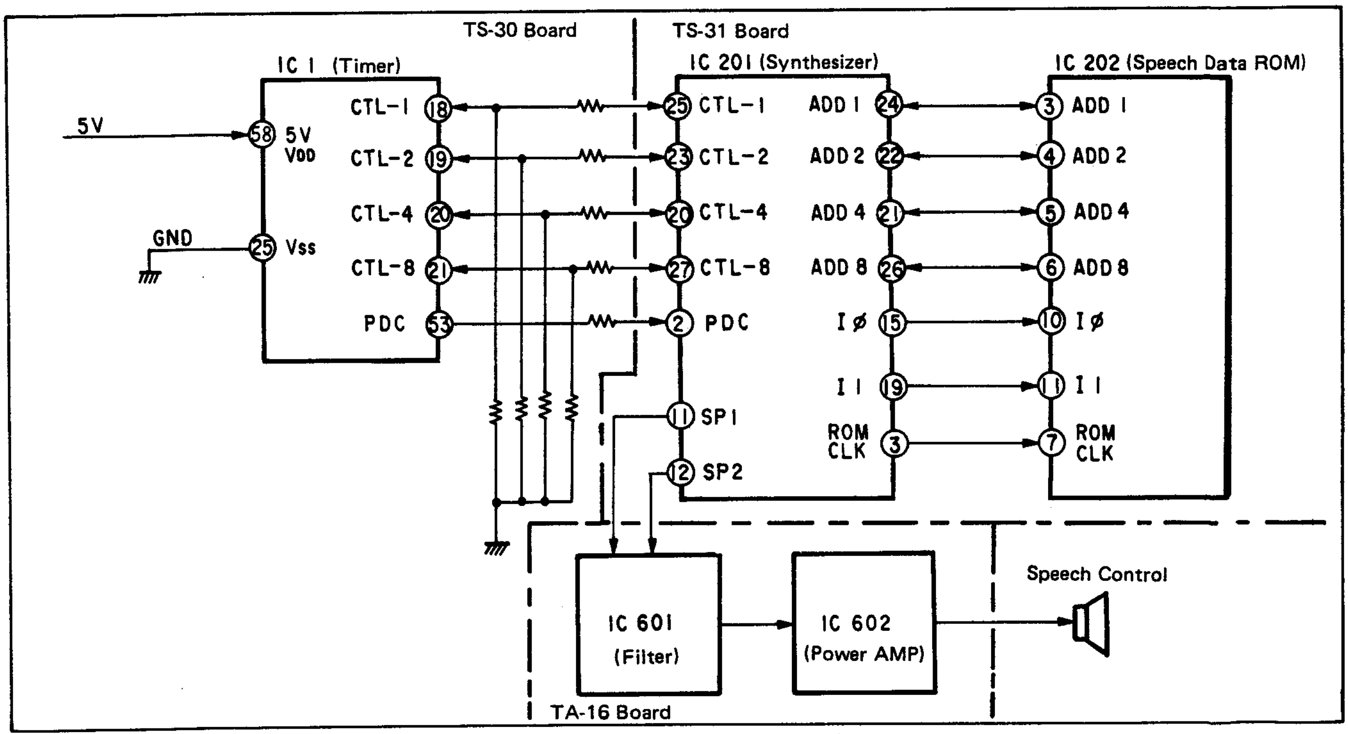

TS-30 Board
TS-31 Board
IC 1 (Timer)
IC 201 (Synthesizer)
IC 202 (Speech Data ROM)
5V
GND
58 5V VDD
25 Vss
CTL-1 18
CTL-2 19
CTL-4 20
CTL-8 21
PDC 53
25 CTL-1
23 CTL-2
20 CTL-4
27 CTL-8
2 PDC
11 SP1
12 SP2
ADD 1 24
ADD 2 22
ADD 4 21
ADD 8 26
Iφ 15
I1 19
ROM CLK 3
3 ADD 1
4 ADD 2
5 ADD 4
6 ADD 8
10 Iφ
11 I1
7 ROM CLK
IC 601 (Filter)
IC 602 (Power AMP)
Speech Control
TA-16 Board

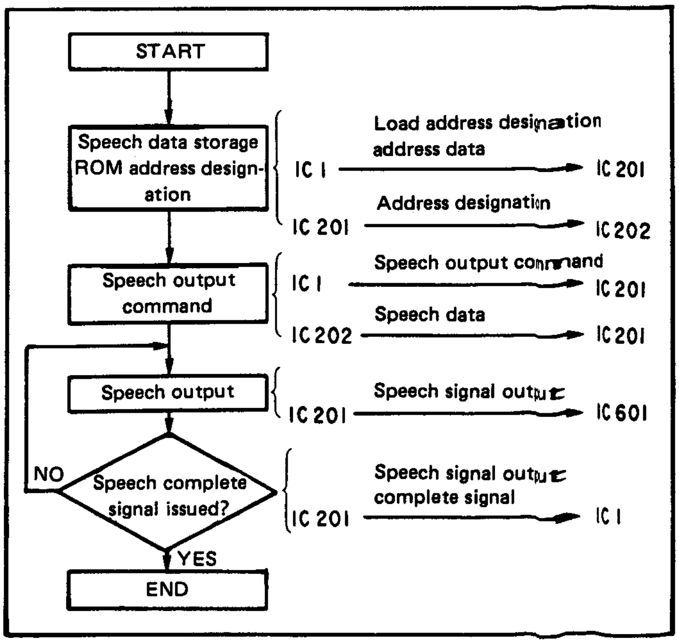
Fig. 5-1 Speech Synthesis Block

5-2. Description of Basic Functions

The controller IC1 decides which words are output when external keys are pressed for speech output. Instructions are then given to IC201 to retrieve the corresponding words from the relevant address in IC202, which is the speech data storage ROM.

The controller IC1 transfers the speech output commands to IC201. On receiving these speech output commands, IC201 gets the designated speech data from IC202 and translates it into speech signals for output. After the speech signals are output, IC201 sends a speech signal output complete signal to controller IC1. This completes one program.

Speech signals output on pins ⑪ and ⑫ of IC201 are fed to the TA-16 Board and drive the speaker after being shaped in IC601 (filter), passing through the VOICE VOLUME selector on the FS-28 Board and after being amplified by IC602 (power AMP).


START
Speech data storage ROM address designation
IC 1 → IC 201 Load address designation address data
IC 201 → IC 202 Address designation
Speech output command
IC 1 → IC 201 Speech output command
IC 202 → IC 201 Speech data
Speech output
IC 201 → IC 601 Speech signal output
Speech complete signal issued?
NO
YES
IC 201 → IC 1 Speech signal output complete signal
END

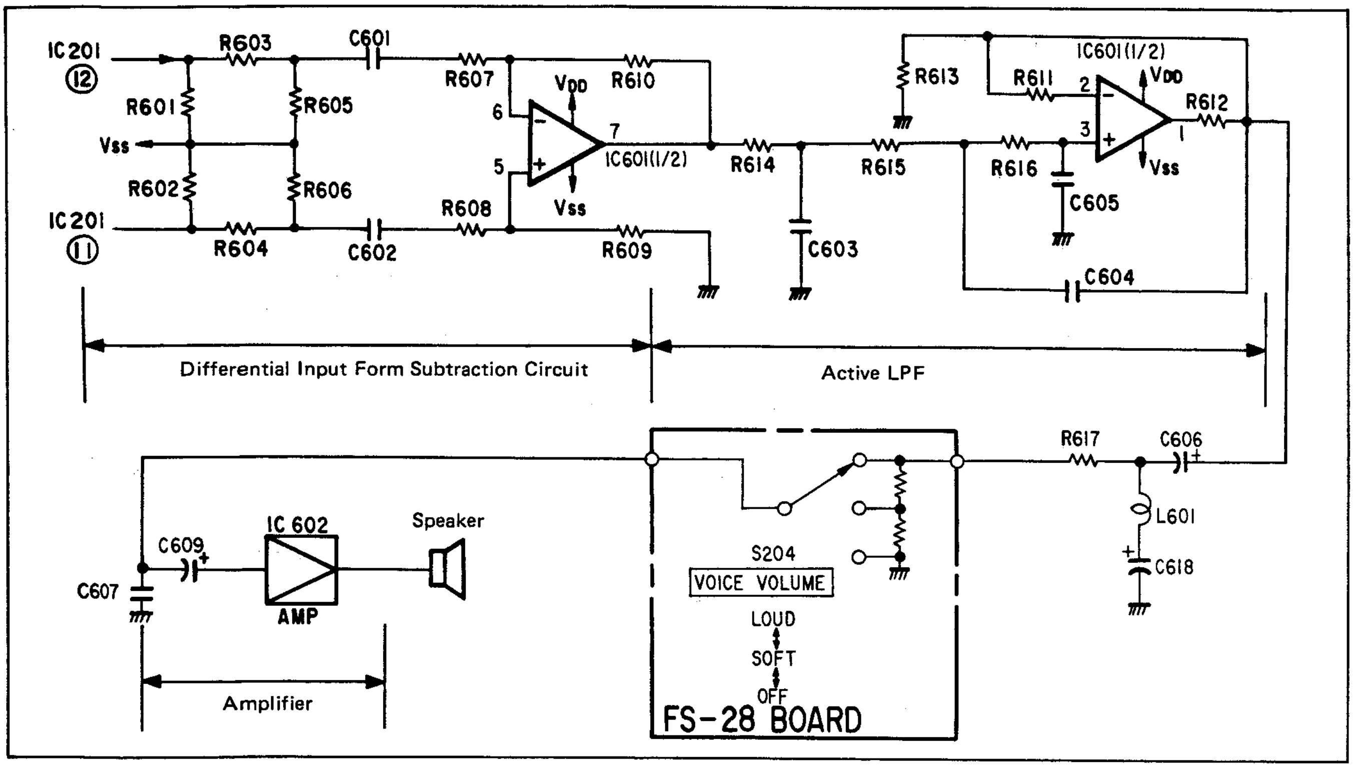

IC201
⑫
R603
C601
R607
R610
VDD
6
7
5
IC601(1/2)
Vss
R601
R605
Vss
R602
R606
IC201
⑪
R604
C602
R608
R609
R614
C603
R613
R611
2
IC601(1/2)
VDD
R612
3
1
R615
R616
C605
Vss
C604
Differential Input Form Subtraction Circuit
Active LPF
R617
C606
L601
C618
C609
IC 602
Speaker
C607
AMP
S204
VOICE VOLUME
LOUD
SOFT
OFF
FS-28 BOARD
Amplifier

Fig. 5-3 Speech Output Circuit

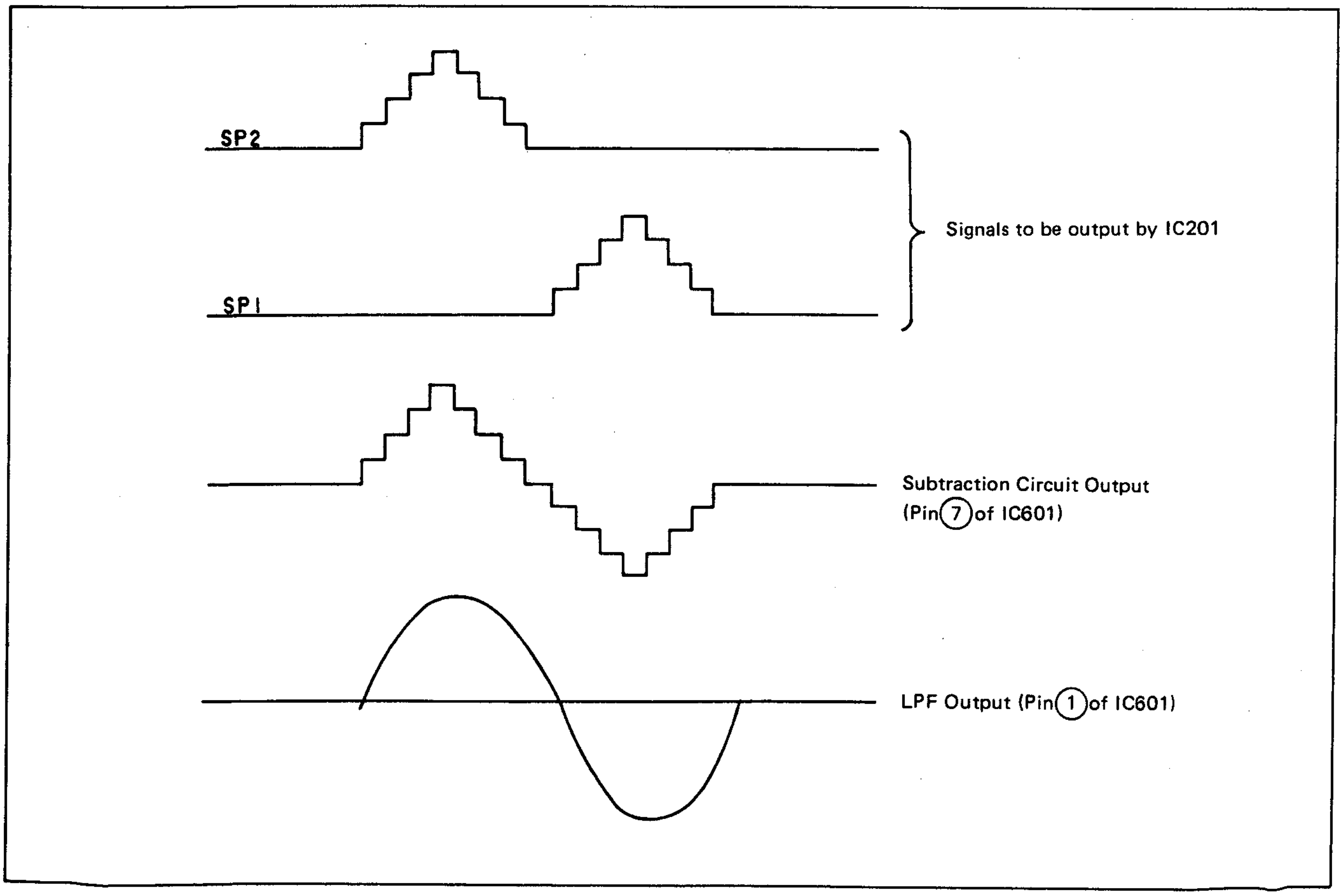


Fig. 5-4

6. TAPE RUNNING INDICATION

IC1 (MB8791) on the CI-5 Board indicates that the tape is running.

This IC has an oscillator circuit on pins ② and ③ and demultiplies this output inside the IC to sequentially light LEDs connected to pins ⑩ through ⑭ to indicate that the tape is running. The LED lighting and extinction sequence for indicating the tape running direction and LED lighting and extinction speed for indicating the tape running speed have to be changed depending on the VTR operating mode. For this purpose, the system control circuit inputs PLAY, REC, FF, REW, and PAUSE signals into IC1.

7. INTERFACE CIRCUIT FOR CHANGER

SL-2410/2415 incorporates a changer. A circuit to mutually exchange control signals with the changer is mounted on the CI-5 Board.

7-1. Changer Power Supply (Pin ① of CN6)

SYS 12V is supplied to the changer through the fuse F1.

7-2. REC·READY Signal (Pin ② of CN6)

This signal is mutually exchanged between the VTR and the changer. When the VTR is ready to record (a tape whose safety tab is not broken is inserted and the VTR is in the stop state), the system control block (pin ㉔ of IC401 on the SS-13 Board) outputs a $\overline{\text{REC·READY}}$ signal ("L"). This signal is inverted in Q8 on the CI-5 Board and is output to the changer as a REC·READY signal ("H"). When the tape has to be changed by the changer during recording in the timer mode when the tape runs out, the changer side changes the REC·READY output to "H". (Pin ㉔ of IC401 ($\overline{\text{REC·READY}}$) in the system control block is "H" and Q8 is switched off.) This output is input to pin ⑥ of the timer IC1 on the TS-30 Board after passing through Q7, Q6, and D2, to notify that timer recording can be continued.

7-3. SIRCS 2 Signal (Pin ③ of CN6) and IR/$\overline{\text{EXT}}$ Signal (Pin ④ of CN6)

The SIRCs 2 signal controls VTR operations from the changer side. The command codes of this signal are exactly the same as the remote control command codes.

The SIRCS2 signal from the changer is input to pin ⑧ of IC301 in the system control block through Q3. The remote control signals are also input from the infrared photodetector section (N Board) to pin ⑧ of IC301 through Q1 and Q2. For this reason, the changer side forcibly changes the level of pin ④ of CN6 (IR/$\overline{\text{EXT}}$) to "L" to kill the remote control signal when the changer side outputs a control signal so that two control signals do not complete.

7-4. $\overline{\text{S CLOCK}}$ Signal (Pin ⑥ of CN6) and $\overline{\text{S DATA}}$ Signal (Pin ⑦ of CN6)

$\overline{\text{S CLOCK}}$ and $\overline{\text{S DATA}}$ signals are sent by the VTR to the changer side to notify VTR operation status.

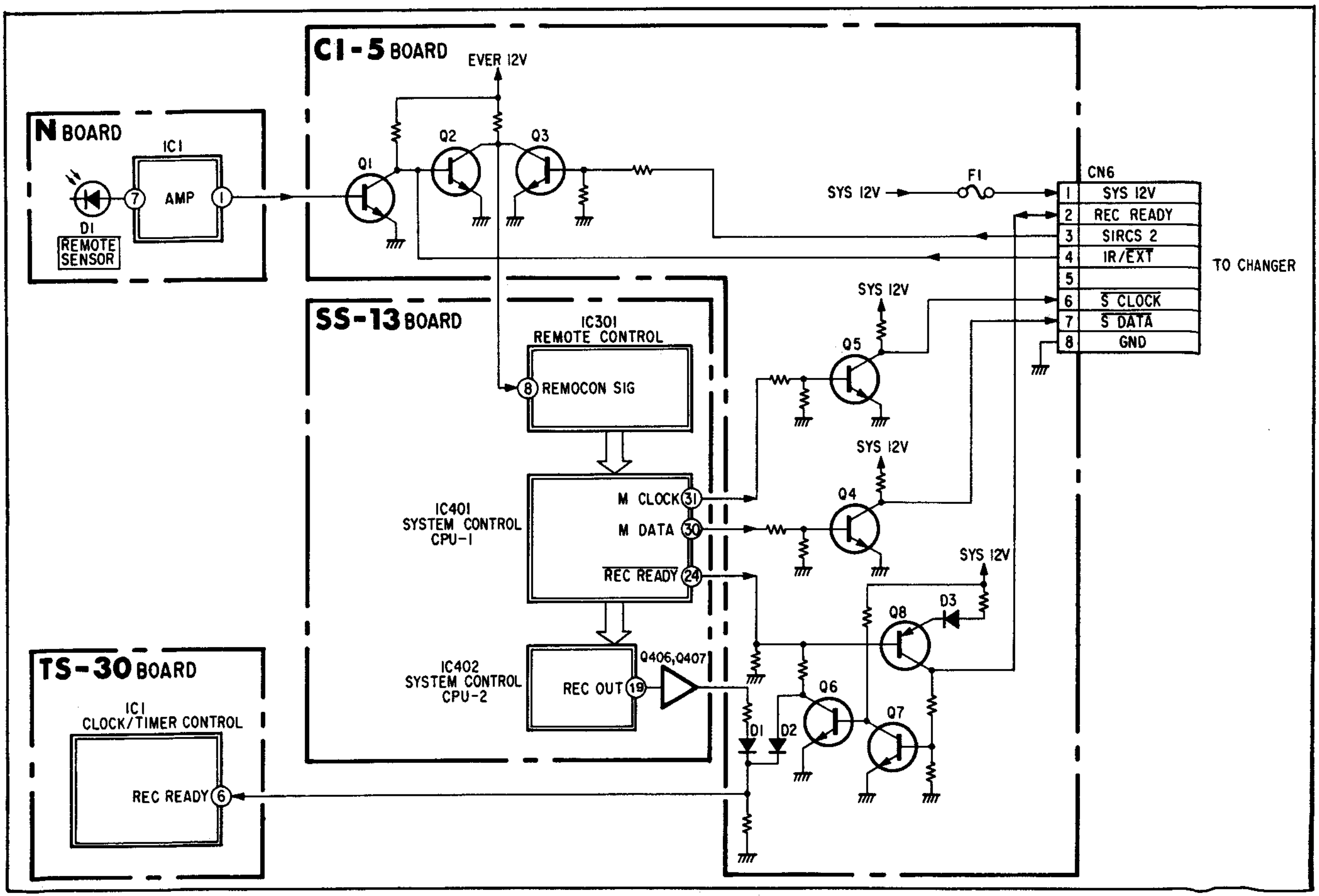

CI-5 BOARD
EVER 12V
Q1
Q2
Q3
N BOARD
IC1
AMP
D1
REMOTE SENSOR
7
1
SYS 12V
F1
CN6
1 SYS 12V
2 REC READY
3 SIRCS 2
4 IR/EXT
5
6 S CLOCK
7 S DATA
8 GND
TO CHANGER
SS-13 BOARD
IC301
REMOTE CONTROL
8 REMOCON SIG
Q5
Q4
IC401
SYSTEM CONTROL
CPU-1
M CLOCK 31
M DATA 30
REC READY 24
Q8
D3
IC402
SYSTEM CONTROL
CPU-2
REC OUT 19
Q406,Q407
Q6
Q7
D1
D2
TS-30 BOARD
IC1
CLOCK/TIMER CONTROL
REC READY 6

Fig. 7-1

8. POWER SUPPLY CIRCUIT

The power supply circuit is composed of the PS-26, PS-27, and PS-30 Boards .

1. REG 12V, SYS 12V, and EVER 16V
   The 16V AC output of power supply transformer T601 is rectified by D101 and fed through regulator IC101. IC101 is controlled by a POWER ON signal from the system control block. When the POWER ON signal (pin ⑩ of CN2) changes to "H", Q101 turns on and changes pin ③ of IC101 to "L". Then IC101 operates to output REG 12V and SYS 12V.
   The rectified output of D101 is output as EVER 16V.
2. EVER 5V and TIMER 5V
   Power transformer T601 outputs 7V and –6V which is rectified by D3 and D5, respectively, and is regulated by Q1 to obtain EVER 5V through D10. Normally, TIMER 5V is the Q1 output obtained through D11. During a short power failure, the voltage stored in C12 is supplied through D13.
3. –4V (EVER)
   Power supply transformer T601 outputs 7V and –6V and this is recitified by D2 and D4, respectively, and –4V (EVER) is obtained after regulation by Q2.
4. EVER 45V
   The 45V output of the power supply transformer T601 is rectified by D1.
5. –25V (EVER) and EVER –12V
   –25V (EVER) is obtained by rectifying the –25V output of the power supply transformer T601 by D17. EVER –12V is obtained by dropping the voltage of –25V (EVER) to –12V using Zener diode D8.
6. AC REFERENCE Signal
   The AC REFERENCE signal is obtained by shaping the –25V output of power supply transformer T601 with D16.
7. 2V AC
   The 2V AC output of power supply transformer T601 is directly supplied to the filament of the fluorescent display tube of the timer.

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SL-2410/2415

both

ADJUSTMENT MANUAL

US Model
SL-2410
SL-2415

Canadian Model
SL-2410

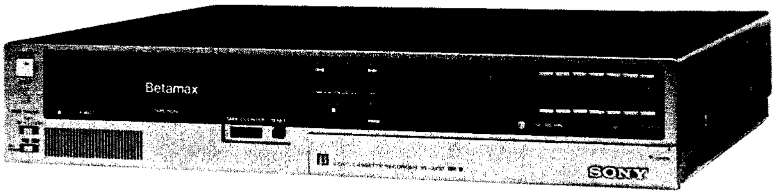

Photo : SL-2410

August, 1983

711B CHASSIS

File this adjustment manual with the service manual.

Beta
VIDEO CASSETTE RECORDER
SONY®

MICROFILM

Consumer
VIDEO

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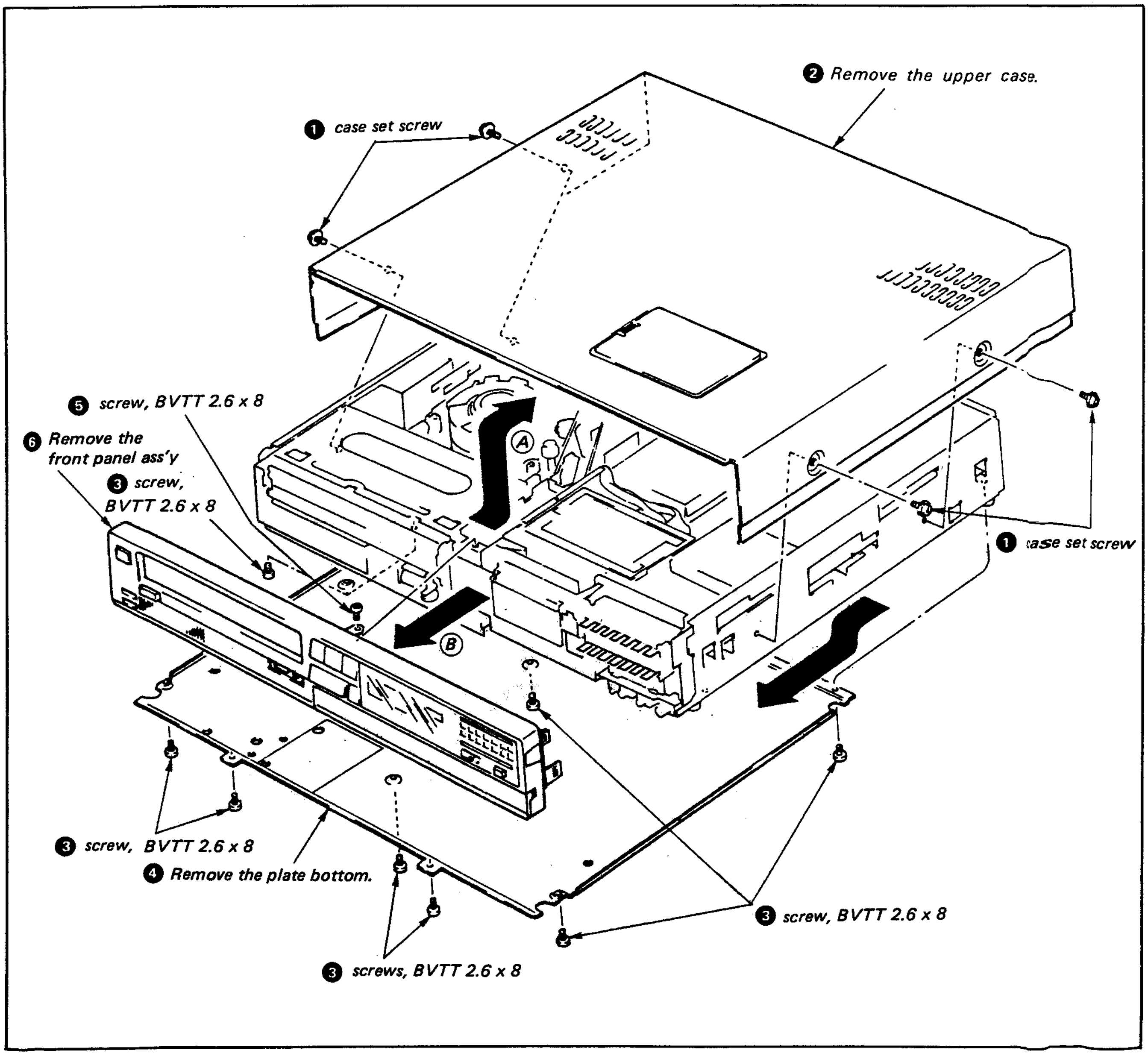
SECTION 1
PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT AND REPLACEMENT

1-1. CABINET ASSEMBLY REMOVAL

❶ Remove the four case set screws.
❷ Remove the upper case in the direction of the arrow Ⓐ.
❸ Remove the ten screws (BVTT2.6x8).
❹ Remove the plate bottom.
❺ Remove the screw (BVTT2.6x8).
❻ Remove the front panel ass'y in the direction of the arrow Ⓑ.



❷ Remove the upper case.
❶ case set screw
❺ screw, BVTT 2.6 x 8
❻ Remove the front panel ass'y
❸ screw, BVTT 2.6 x 8
Ⓐ
Ⓑ
❶ case set screw
❸ screw, BVTT 2.6 x 8
❹ Remove the plate bottom.
❸ screw, BVTT 2.6 x 8
❸ screws, BVTT 2.6 x 8

Fig. 1-1. Removal of the upper/lower case and the front Panel

1-2. RP-8 BOARD REMOVAL

❶ Remove the two screws (BVTT2.6×6).

❷ Remove the RP-8 board block.

❸ Pull out the three connectors.

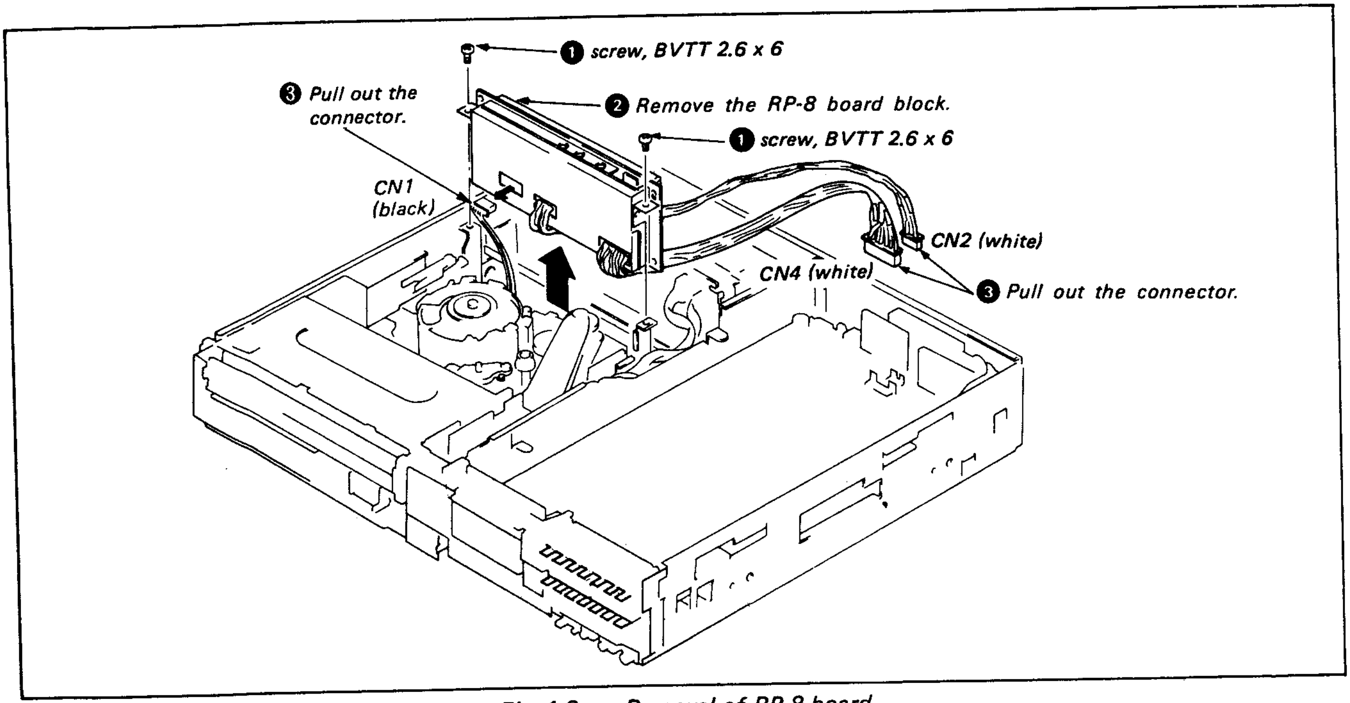

❶ screw, BVTT 2.6 x 6
❸ Pull out the connector.
❷ Remove the RP-8 board block.
❶ screw, BVTT 2.6 x 6
CN1 (black)
CN2 (white)
CN4 (white)
❸ Pull out the connector.

Fig. 1-2. Removal of RP-8 board

1-3. TA-16 BOARD REMOVAL

❶ Remove the three screws (BVTT2.6x6).

❷ Pull out the eleven connectors.

❸ Lift up the TA-16 board in the direction of the arrow. (Supported using a video cassette tape.)

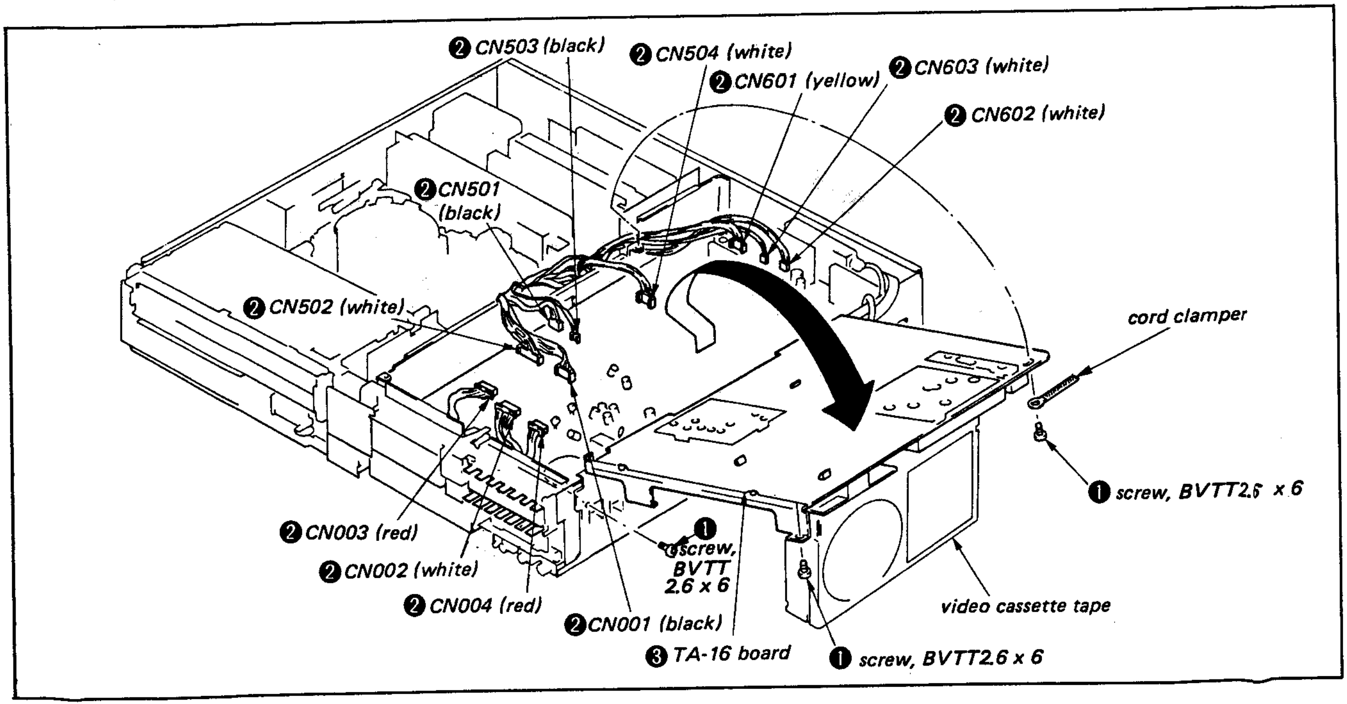

❷ CN503 (black)
❷ CN504 (white)
❷ CN601 (yellow)
❷ CN603 (white)
❷ CN602 (white)
❷ CN501 (black)
❷ CN502 (white)
cord clamper
❶ screw, BVTT2.6 x 6
❷ CN003 (red)
❷ CN002 (white)
❷ CN004 (red)
❶ screw, BVTT 2.6 x 6
❷ CN001 (black)
❸ TA-16 board
❶ screw, BVTT2.6 x 6
video cassette tape

Fig. 1-3. Removal of TA-16 board

1-4. SS-13 BOARD REMOVAL

❶ Remove the two screws. (BVTT2.6 x 6)

❷ Remove the SS-13 board in the direction of the arrow. (Supported using a video cassette tape.)

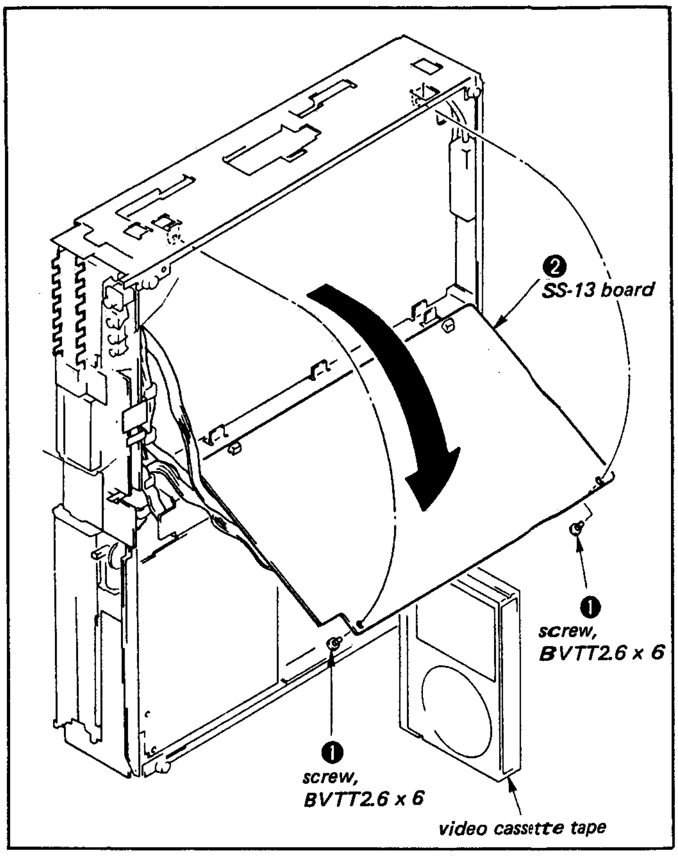

❷ SS-13 board
❶ screw, BVTT2.6 x 6
❶ screw, BVTT2.6 x 6
video cassette tape

Fig. 1-4. Opening of SS-13 board

1-5. POWER BLOCK REMOVAL

❶ Remove the screw. (BVTT2.6 x 6).

❷ Remove the CI-5 board.

❸ Remove the five screws. (BVTT2.6 x 6)

❹ Pull out the six connectors.

❺ Remove the screw. (BVTT2.6 x 8)

❻ Remove the PS-29 board.

❼ Remove the power block in the direction of the arrow.

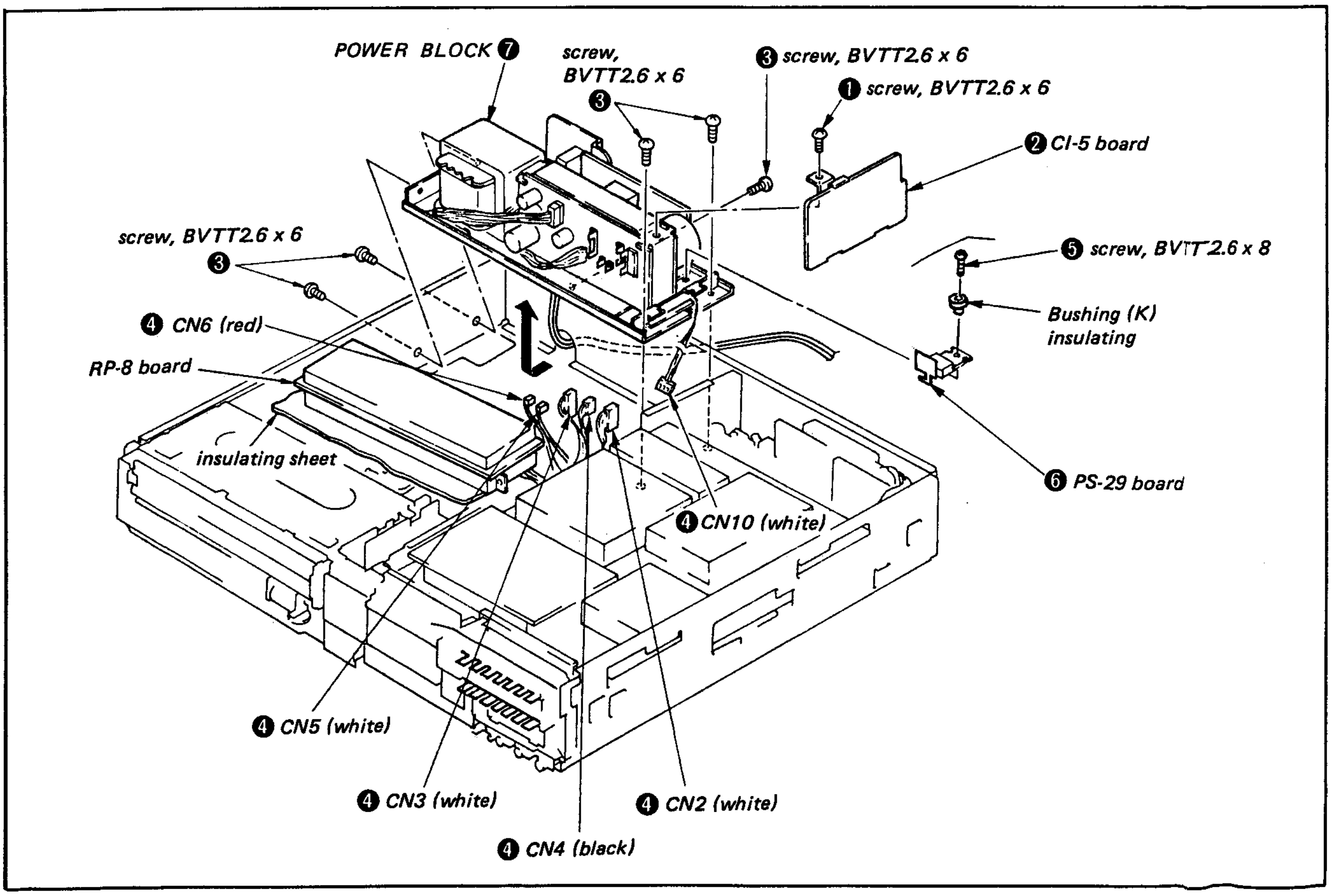

POWER BLOCK ❼
screw, BVTT2.6 x 6 ❸
❸ screw, BVTT2.6 x 6
❶ screw, BVTT2.6 x 6
❷ CI-5 board
screw, BVTT2.6 x 6 ❸
❺ screw, BVTT2.6 x 8
Bushing (K) insulating
❹ CN6 (red)
RP-8 board
insulating sheet
❻ PS-29 board
❹ CN10 (white)
❹ CN5 (white)
❹ CN3 (white)
❹ CN2 (white)
❹ CN4 (black)

Fig. 1-5. Removal of power block

1-6. OPERATION OF THE UNIT WITH THE FL CASSETTE COMPARTMENT REMOVED

1-6-1. How to Put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed

❶ Connect jumper wires to short pin 1 of the CN301 connector on CS-3 board to pin 2, and pin 3 to pin 4.

Note:
Be careful that the jumper wires do not touch any other parts (use tape or other insulation).

❷ Press the cassette-in switch and leave it pressed in. When the power button is turned ON, threading starts.

- * Refer to section 3-6 for instructions on how to remove the FL cassette compartment.

[How to EJECT in this condition]

- Press the EJECT button. When unthreading is completed and the internal gear starts to turn, turn the power OFF.

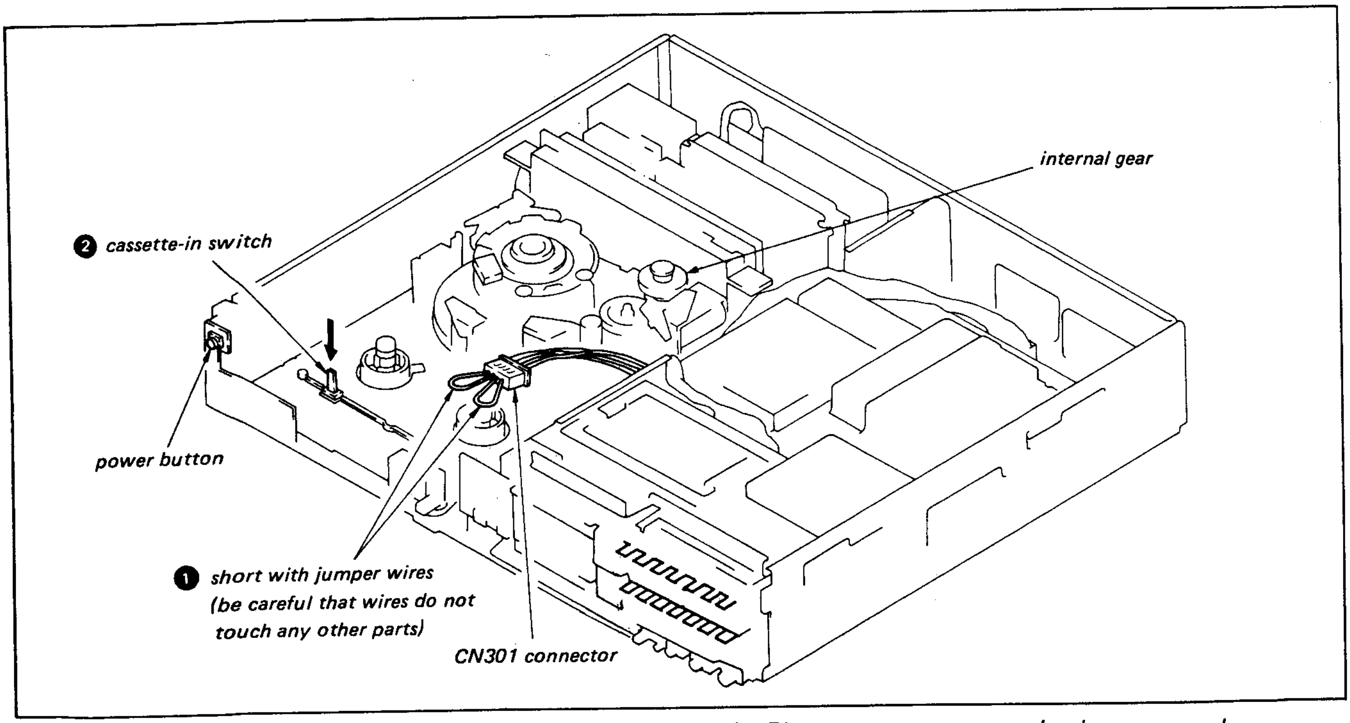

internal gear
❷ cassette-in switch
power button
❶ short with jumper wires
(be careful that wires do not
touch any other parts)
CN301 connector

Fig. 1-6. How to thread the tape when the FL cassette compartment has been removed

1-6-2. Playback Without Cassette Installed

Complete threading by the procedure described in 1-6-1, then press the playback button.

1-6-3. How to Put in Recording Mode Without Cassette Installed

1. Thread by the procedure in 1-6-1, then press the accidental erasure prevention switch shown in Fig. 1-7.
2. With the accidental erasure prevention switch pressed down, press the recording button.

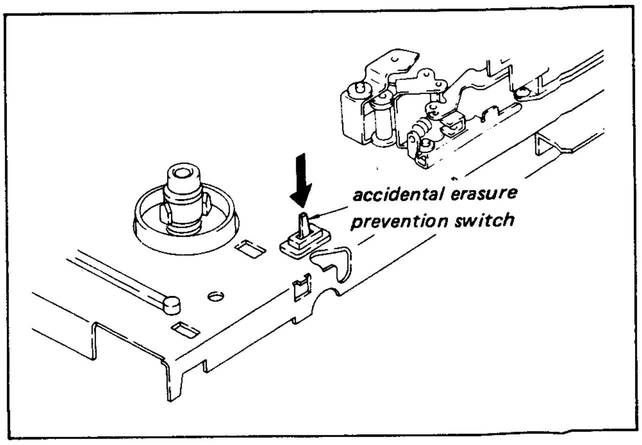

accidental erasure
prevention switch

Fig. 1-7. How to put the recorder in recording mode with the FL cassette compartment removed

1-7. HOW TO LOAD, THREAD, UNLOAD AND UNTHREAD WITH THE POWER OFF

1-7-1. Manual Loading and Unloading

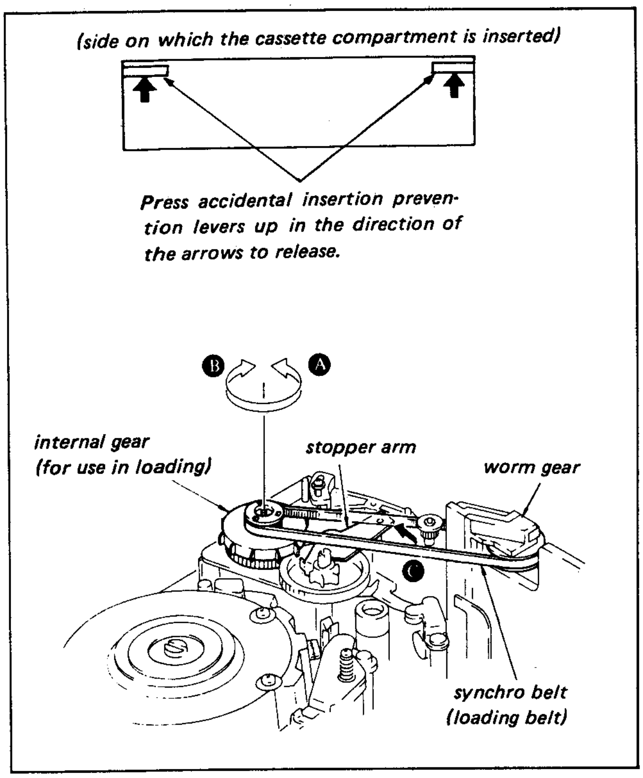

(side on which the cassette compartment is inserted)
Press accidental insertion prevention levers up in the direction of the arrows to release.
Ⓑ
Ⓐ
internal gear (for use in loading)
stopper arm
worm gear
Ⓒ
synchro belt (loading belt)

Fig. 1-8. Manual loading and unloading

1) Release the right and left accidental insertion prevention levers inside the cassette compartment, then press the stopper arm in the direction of arrow Ⓒ and release the internal gear stop.
2) Turn the internal gear manually in the direction of arrow Ⓐ until loading is completed.
3) To unload, turn the internal gear in the direction of arrow Ⓑ.

Note:

When the loading belt has been removed, load and unload by turning the worm gear manually.

1-7-2. Manual Threading and Unthreading

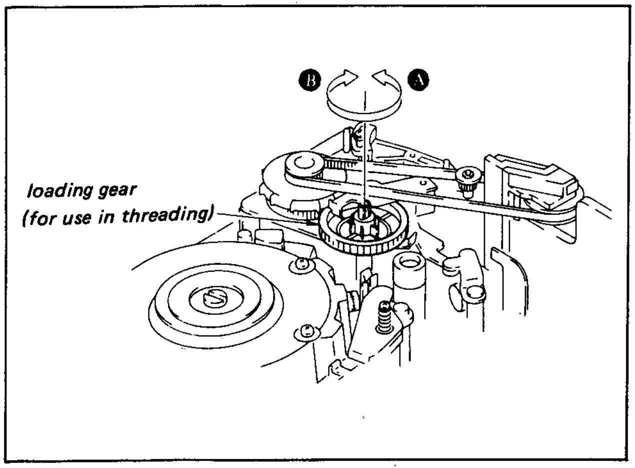

Ⓑ
Ⓐ
loading gear (for use in threading)

Fig. 1-9. Manual threading and unthreading

1) Turn the loading gear in the direction of arrow Ⓐ until loading is completed.
2) To unthread, turn the loading gear in the direction of arrow Ⓑ.

   Note:

   Always turn the loading gear by hand.
   Never use a screwdriver or other tool.

1-8. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name	Part No.	Carved JIG No.	Use and Remarks
J-1	Torque Measurement Tape	J-6080-003-C	SL-0003C	forward torque and back tension measurement
J-2	Parallel Plate	J-6086-750-A	SL-0657	audio/CTL head lateral adjustment capstan shaft vertical adjustment
J-3	Dental Mirror (handle) Dental Mirror (mirror)	J-6080-029-A J-6080-030-1	SL-5052	tape path and tape traveling adjustment check
J-4	Alignment Tape (KR5-1M)	8-969-995-82	——	tracking, overall adjustment of picture quality, etc.
J-5	Cleaning Fluid	Y-2031-001-0	——	
J-6	Thickness Gauge	9-911-053-00		
J-7	Chamois Cloth	2-034-697-00	——	cleaning
J-8	Head Demagnetizer	widely available	——	demagnetization of video head and audio head
J-9	Cleaning Cassette Tape	8-888-004-00	——	video head cleaning
J-10	Dihedral Adjustment Screw	J-6080-013-1	SL-0013	video dihedral adjustment
J-11	Sector Type Gauge (50g)	7-732-050-20		soft braking measurement
J-12	Reel Table Tension Gauge	J-6080-011-A	SL-0011	torque measurement

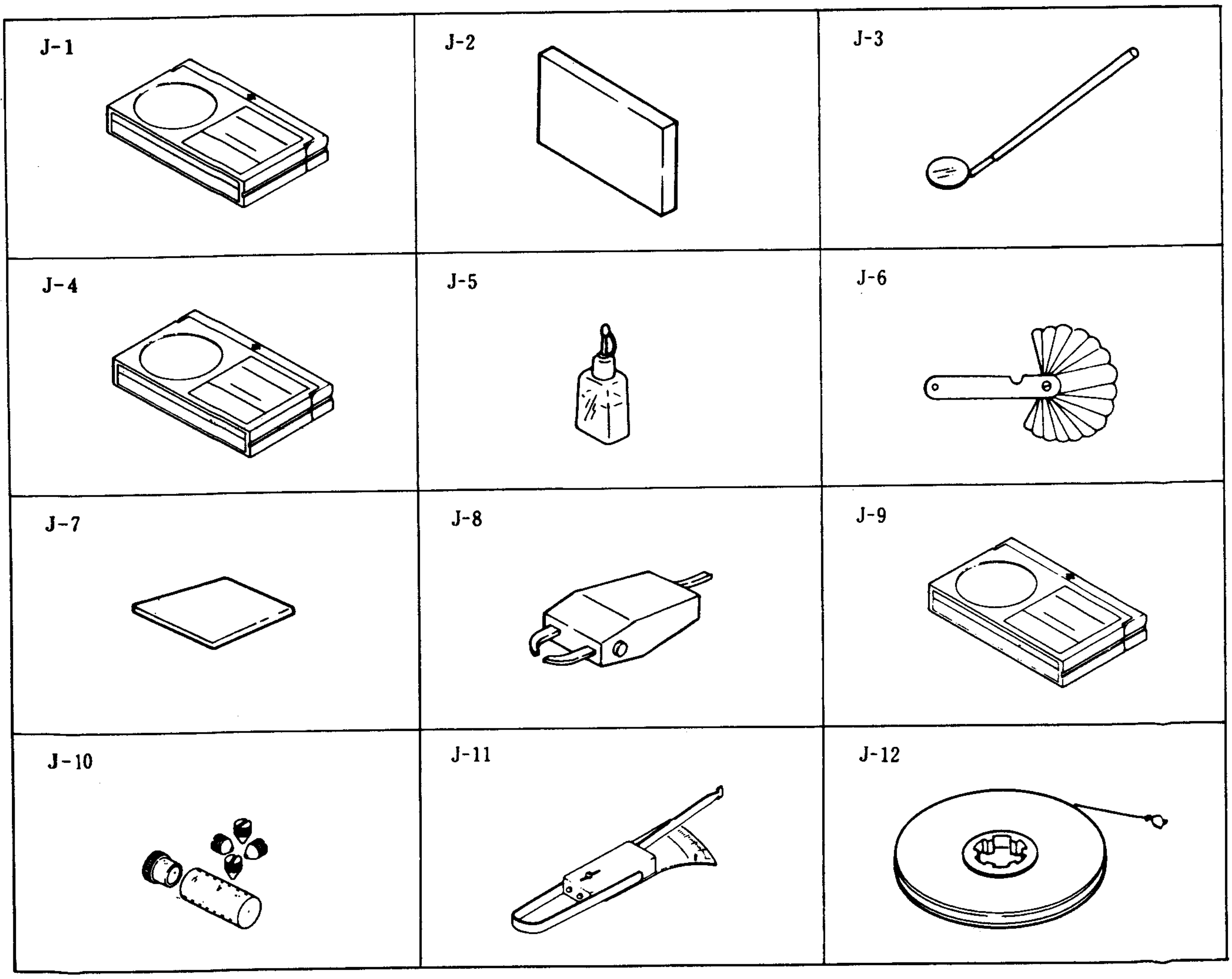


Fig. 1-10. Tools and fixtures required for servicing

SECTION 2
PERIODIC CHECK AND MAINTENANCE

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

2-1. POST-REPAIR MAINTENANCE

The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1-1. Cleaning of Rotating Head Disk Assembly

1) Press a chamois cloth (Jig Ref. No. J-7) which has been dipped in cleaning fluid (Jig Ref. No. J-5) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a right angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-1-2. Cleaning of the Tape Transportation System

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-1-3. Cleaning of the Drive System

1) Clean the drive system parts with a cloth that has been dipped in cleaning fluid.

parts requiring cleaning

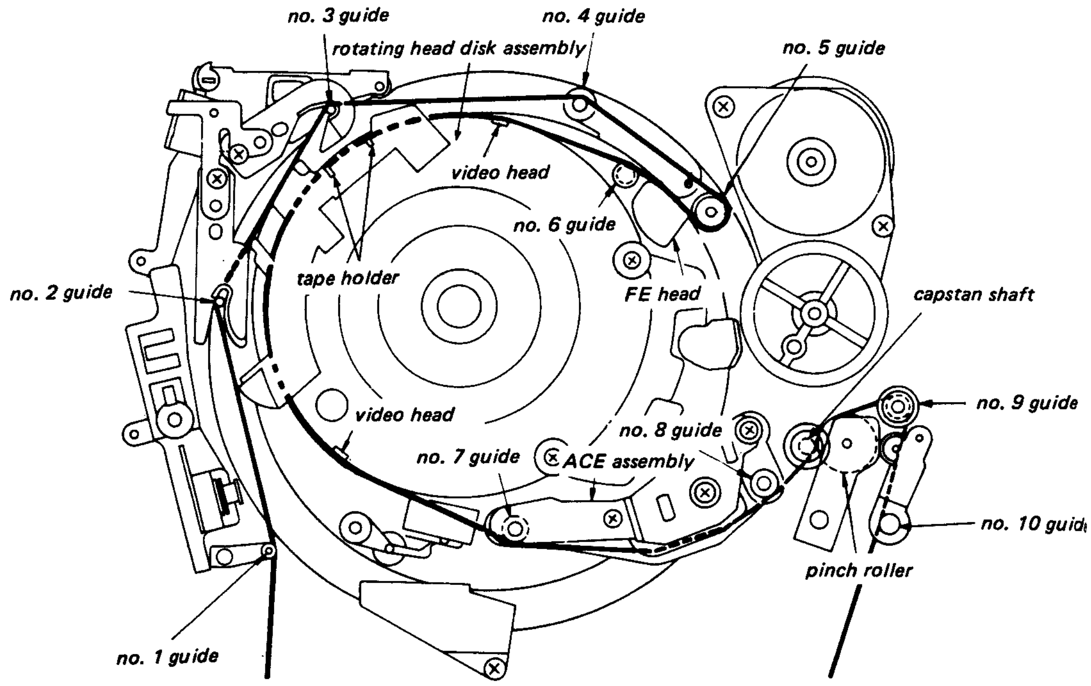

no. 3 guide
no. 4 guide
rotating head disk assembly
no. 5 guide
video head
no. 6 guide
tape holder
no. 2 guide
FE head
capstan shaft
no. 9 guide
video head
no. 8 guide
no. 7 guide
ACE assembly
no. 10 guid
pinch roller
no. 1 guide

Fig. 2-1. Parts requiring cleaning

2-2. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to user's operating hours.

Maintenance & Check		Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
		Operating Hours (H)											
Tape Trans-Portation System	Cleaning of tape transportation system	———	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	———	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y	———	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Loading belt (synchro belt)	3-679-119-00	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	• This cleaning must be done whenever a repair is made.
	Cleaning of iron core and opening of solenoid	———	–	–	–	○	–	–	–	○	–	–	Wipe iron core and opening of solenoid with dry cloth.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		–	☆	–	☆	–	☆	–	☆	–	☆	Specified value: adjust to 30 g·cm ± 5 g·cm
	Confirmation of brake system		–	☆	–	☆	–	☆	–	☆	–	☆	
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80 g·cm ± 5 g·cm (SL-0003C)

○ Cleaning ★ Replacement ☆ Confirmation

Note:
On overhaul
When overhauling the unit, replace parts as indicated in the above table.

SECTION 3

CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. REPLACEMENT OF ROTATING HEAD DISK ASSEMBLY

3-1-1. Removal of the Rotating Head Disk Assembly (Fig. 3-1)

❶ Remove the two screws that hold the damper assembly in place, then remove the damper assembly.

❷ Use an Allen wrench to remove the hexagonal socket bolt that holds the upper drum assembly in place, then remove the upper drum assembly.

Note:
Turn the upper drum to remove, being careful not to move the adjust plate. Movement of the adjust plate will have a great effect on the tape path, so caution is required.

❸ Unsolder the rotating head disk relay plate (4 red and white leads).

❹ Remove the two hexagonal socket bolts holding rotating head disk assembly ❺ in place, then remove the rotating head disk assembly.

Note:
Be careful not to touch the head tip with the hand or hit anything against it.

3-1-2. Mounting of the Rotating Head Disk Assembly (Fig. 3-1)

1) Insert rotating head disk ❺ in place, being careful of the direction so that the red and white leads are in the right places.
2) Tighten hexagonal socket bolt ❹ and solder the lead wires.

Note:
Be careful to solder the lead wires correctly and not to break any wires.

3) Attach the upper drum, being careful (as during removal) not to move the adjust plate. While pressing the two points that determine the height, tighten hexagonal socket bolt ❷.

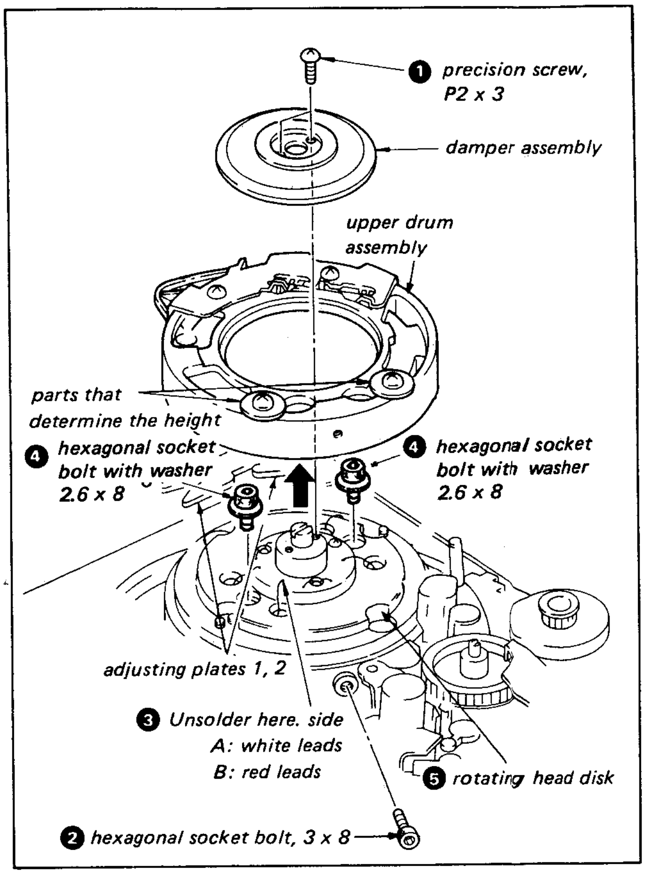
Note:
When inserting the upper drum, be careful that it does not touch the head tip.

Note:
When replacing the rotating drum head, the rotating head disk assembly may be hard to remove. In such a case, remove it using the method explained below (Fig. 3-2).

❶ Remove the hexagonal socket bolts that hold the rotating head disk assembly in place.

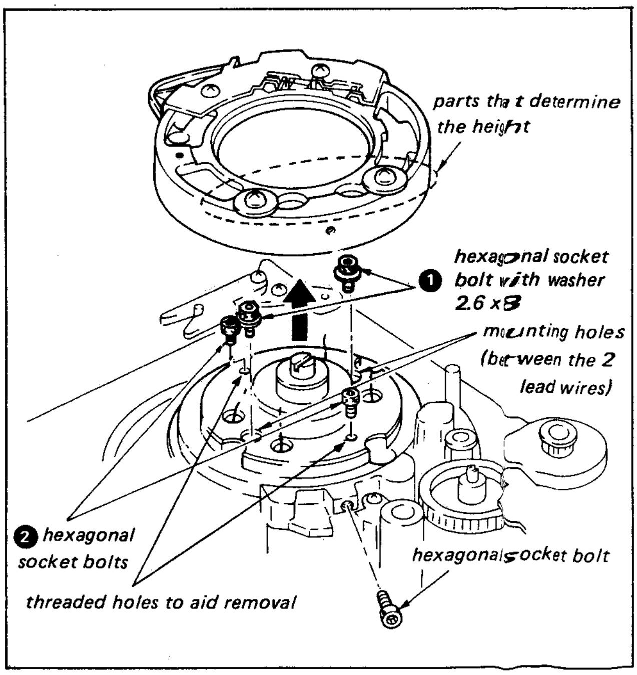
❷ When the head disk is jammed on tight and is hard to remove, screw the hexagonal socket bolts removed in step ❶ into the threaded holes 90° away from the original holes. Tighten them a little at a time.

The head disk will be lifted up by the two screws and will come off easily.



❶ precision screw, P2 x 3
damper assembly
upper drum assembly
parts that determine the height
❹ hexagonal socket bolt with washer 2.6 x 8
❹ hexagonal socket bolt with washer 2.6 x 8
adjusting plates 1, 2
❸ Unsolder here. side A: white leads B: red leads
❺ rotating head disk
❷ hexagonal socket bolt, 3 x 8

Fig. 3-1. Removal of the rotating head disk assembly I



parts that determine the height
hexagonal socket ❶ bolt with washer 2.6 x 8
mounting holes (between the 2 lead wires)
❷ hexagonal socket bolts
hexagonal socket bolt
threaded holes to aid removal

Fig. 3-2. Removal of the rotating head disk assembly II

3-2. VIDEO HEAD DIHEDRAL CHECK AND ADJUSTMENT

This adjustment is generally unnecessary, but it is sometimes necessary when the video head disk is replaced. (The video head disk used for maintenance has been precision adjusted at the factory using a microscope and almost never needs to be readjusted.)

When judging whether the video head dihedral angle is correct, the alignment tape is played back. When this is hone the tracking control knob must be in the center position.

If the check is done with this knob in other than the center click position (if the tracking is off-center), even if the dihedral angle is correct the picture will be reproduced as if it were off.

Before this adjustment is performed, the ACE assembly position adjustment (refer to the section where the tape path adjustment is described) must be completed.

[Method of checking]

With the tracking control knob set to the center click position, play back the βII monoscope section of the alignment tape. Check to see if any of the vertical monoscope lines immediately below the switching pulse are reproduced double. If not, the dihedral angle is correct and does not have to be adjustment. If so, perform the adjustment as explained below.

[Method of adjustment]

1) As shown in Fig. 3-3, screw two dihedral angle adjustment screws (Jig Ref. No. J-10) into the adjustment screw holes on the side on which the red lead wires from the video head are connected, until the top of the screw is level with the video head disk. (If they are not screwed in far enough, the video head disk will not turn past the point where the top of the adjustment screw strikes the upper drum. Conversely, if it is screwed in too far, the head base will be moved, throwing the video head dihedral angle way off.)
   Note:
   The side on which the white lead wires are connected is the reference side and must not be moved.
2) Screw one of the two adjustment screws in a little bit farther until resistance is felt. Beyond this point, turning the screw still farther will move the video head, adjusting the dihedral angle.
3) With the adjustment screws in place, play the βII monoscope signal section of the alignment tape and see how the lines are reproduced. If the vertical lines are split apart more than before, turn the screw which was screwed in more tightly counterclockwise to loosen it, then adjust by tightening the other screw.
4) After the adjustment is completed, remove the adjustment screws and play the tape again to reconfirm that the adjustment is correct.

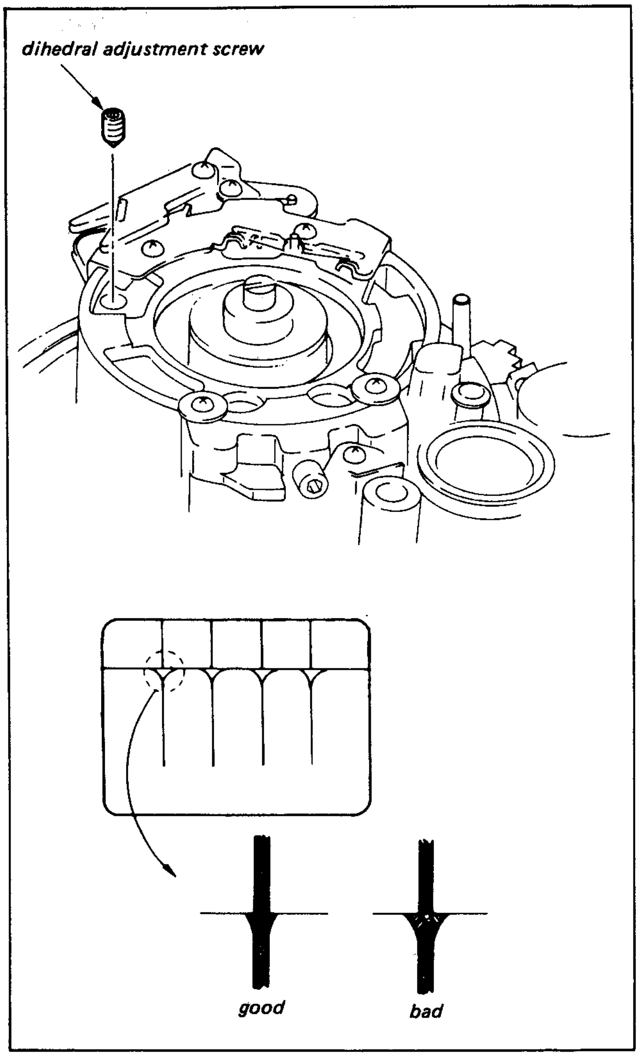


Fig. 3-3. Video head dihedral adjustment

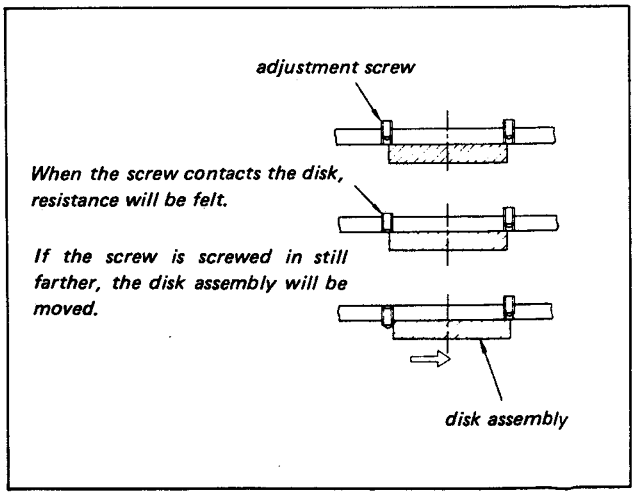

adjustment screw
When the screw contacts the disk, resistance will be felt.
If the screw is screwed in still farther, the disk assembly will be moved.
disk assembly

Fig. 3-4.

3-3. REPLACEMENT AND ADJUSTMENT OF THE DRUM ASSEMBLY

3-3-1. Replacement of the Drum Assembly

❶ Measure gap Ⓐ between adjust plate 1 and the upper drum holder section, and record the measurement.

Note:
The position where the adjust plate is mounted has a large effect on the tape path, so this measurement must be performed.

❷ Measure gap Ⓑ between adjust plate 2 and the upper drum holder section, and record the measurement.

Note:
The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.

❸ Remove the screws shown in Fig. 3-5, then remove the tape guide ground plate and adjust plates 1 and 2.

❹ Remove the 3 connectors from the rear of the chassis as shown in Fig. 3-6.

❺ Remove the 3 drum mounting screws from the rear of the chassis, then remove the main body of the drum assembly. After the replacement has been completed, adjust the drum path.

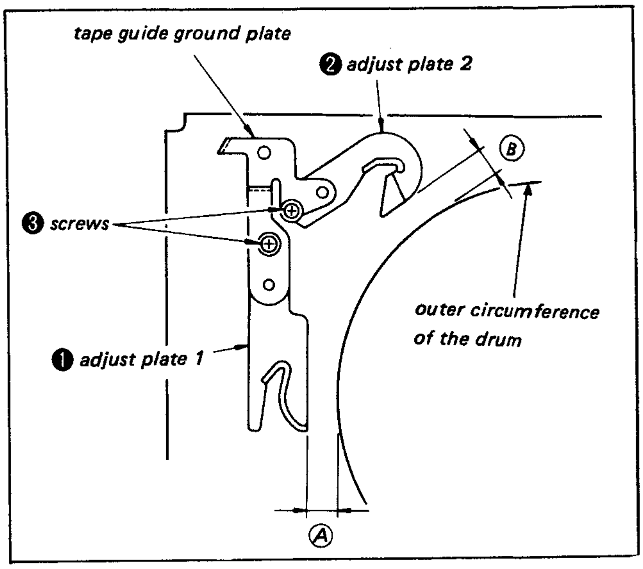

tape guide ground plate
❷ adjust plate 2
Ⓑ
❸ screws
outer circumference of the drum
❶ adjust plate 1
Ⓐ

Fig. 3-5. Position measurement of adjust plates 1 and 2

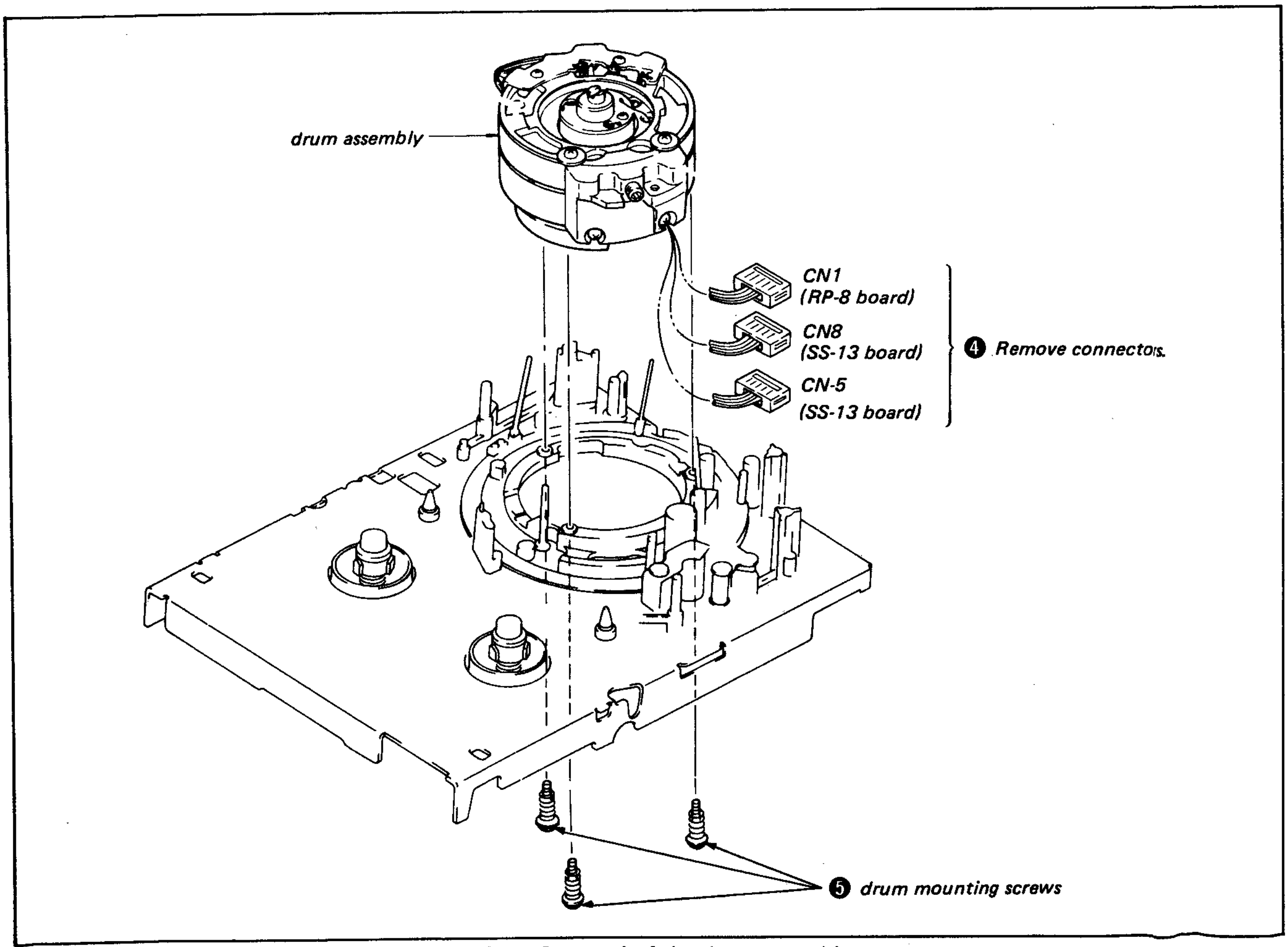

drum assembly
CN1 (RP-8 board)
CN8 (SS-13 board)
CN-5 (SS-13 board)
❹ Remove connectors.
❺ drum mounting screws

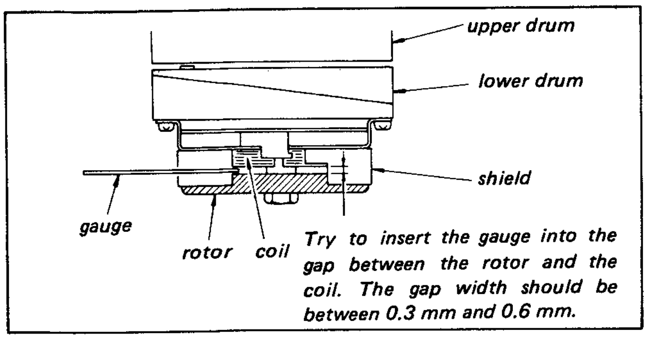
Fig. 3-6. Removal of the drum assembly

3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly

After replacing the drum assembly, adjust the gap between the motor rotor and the coil to 0.3 mm to 0.6 mm (Fig. 3-7).

[Procedure]

1) When re-assembling the drum, use the spacers which were removed to produce a gap of between 0.3 mm and 0.6 mm. Measure the gap using the gauge that comes with the drum for assembly and maintenance use. One side of the gauge is 0.3 mm and the other side is 0.6 mm. If the gap is adjusted correctly, the 0.3 mm side should fit in and the 0.6 mm side should not.
2) If this fails to give the correct gap width, do not use the spacers which were removed; instead, use a combination of the four 0.3mm accessory spacers to obtain the correct width.

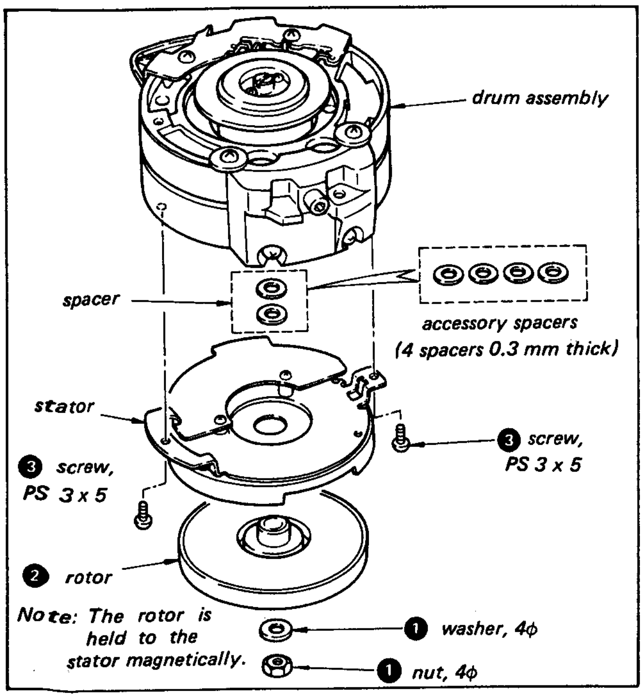

upper drum
lower drum
shield
gauge
rotor
coil

Try to insert the gauge into the gap between the rotor and the coil. The gap width should be between 0.3 mm and 0.6 mm.

Fig. 3-7. Checking the motor gap width after replacing the drum assembly

Removal of the stator and rotor when replacing the drum

❶ Remove the nut and washer.
❷ Remove the rotor from the stator.
❸ Remove the 2 screws, then remove the stator from the main body of the drum.


drum assembly
spacer
accessory spacers
(4 spacers 0.3 mm thick)
stator
❸ screw, PS 3 x 5
❸ screw, PS 3 x 5
❷ rotor
❶ washer, 4ϕ
❶ nut, 4ϕ

Note: The rotor is held to the stator magnetically.

Fig. 3-8. Removal of the stator and rotor when replacing the drum

3-4. REPLACEMENT OF THE CAPSTAN MOTOR

3-4-1. Removal of the Capstan Motor (Fig. 3-9)

- Remove screws ❶, ❷ and ❸, then remove the capstan motor from the rear of the mechanical chassis.

  Note:

  After replacing the capstan motor, adjust the tape path as explained in section 4-3.

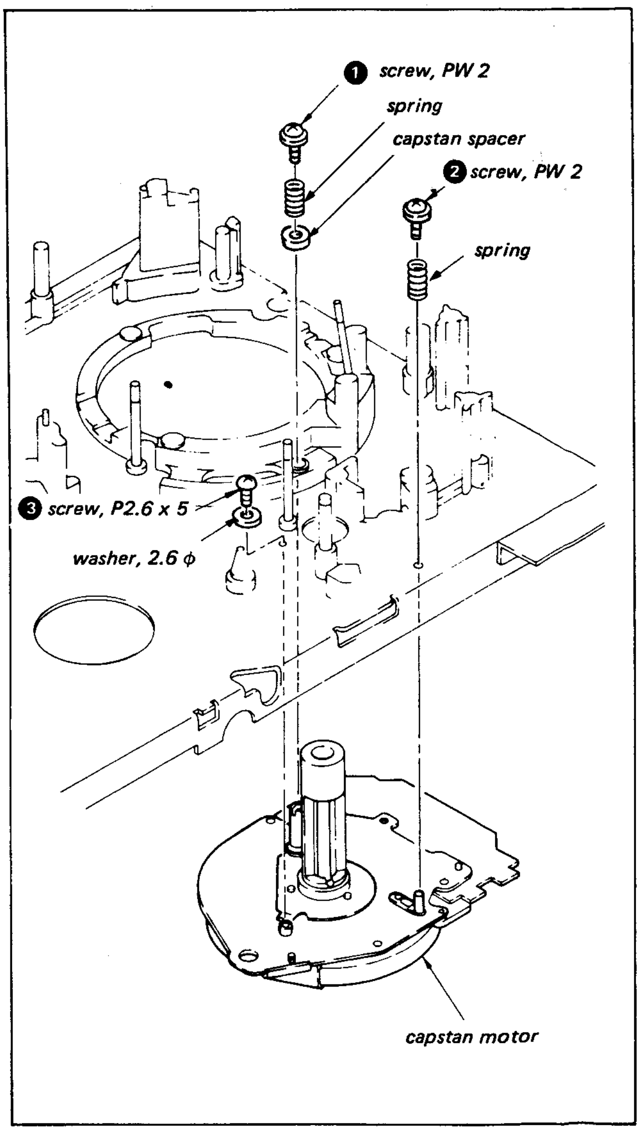

❶ screw, PW 2
spring
capstan spacer
❷ screw, PW 2
spring
❸ screw, P2.6 x 5
washer, 2.6 ϕ
capstan motor

Fig. 3-9 Removal of the capstan motor

3-5. REMOVAL OF THE S COIL SENSOR (Fig. 3-10)

❶ Remove the spring.
❷ Remove the claw in the direction of arrow Ⓐ, then pull the S coil sensor out.
❸ Unplug the connector from CN407 on SS-13 board.

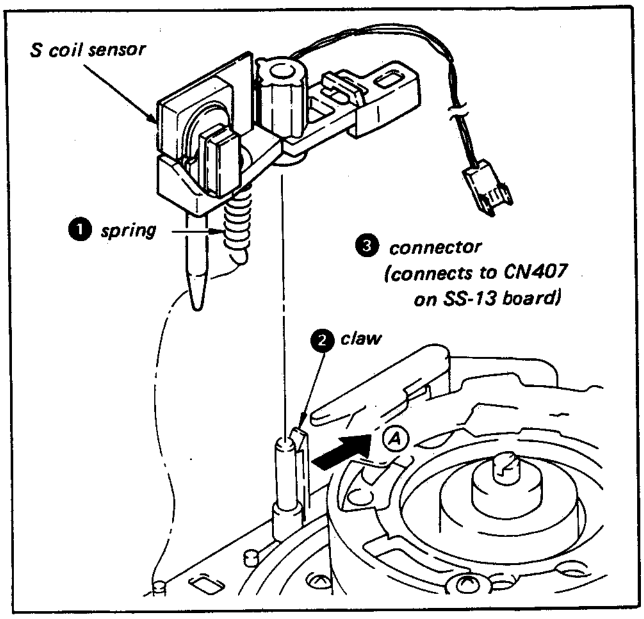

S coil sensor
❶ spring
❸ connector (connects to CN407 on SS-13 board)
❷ claw
Ⓐ

Fig. 3-10. Removal of the S coil sensor

3-6. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY (Fig. 3-11)

❶ Pull the internal gear flange out.
❷ Remove the synchro belt.
❸ Remove the 5 screws (BVTT2.6×6).
❹ Pull connector CN417 (white) out.
❺ Remove the FL cassette compartment section in the direction of arrow Ⓐ.

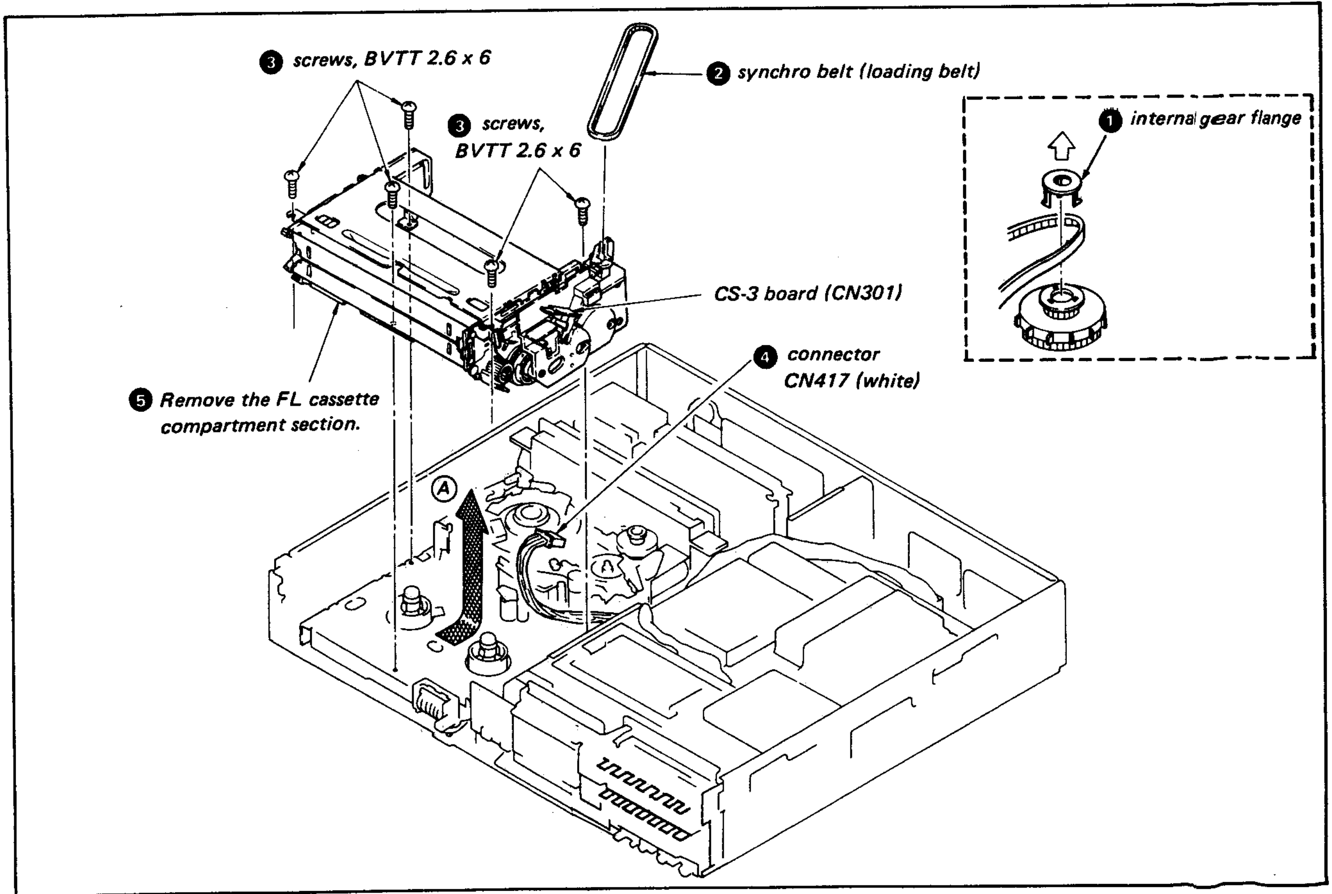

❸ screws, BVTT 2.6 x 6
❷ synchro belt (loading belt)
❸ screws, BVTT 2.6 x 6
❶ internal gear flange
CS-3 board (CN301)
❹ connector CN417 (white)
❺ Remove the FL cassette compartment section.
Ⓐ

Fig. 3-11. Removal of the FL cassette compartment assembly

3-7. ADJUSTMENT OF THE FL CASSETTE COMPARTMENT

3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly

In the FL cassette compartment assembly, the cassette holder must always move parallel to the mechanical chassis. The gear system is used to control the amount by which the cassette holder advances so that this will be the case. Consequently, if the gears in this section slip out of mesh, the next time the unit is assembled the gear mesh must be adjusted to the correct position; otherwise the cassette will not feed properly.

[Adjustment of the gear positions]

❶ Prepare a positioning rod about 200 mm long and 1.5 mm in diameter.
❷ While passing the positioning rod through the combination of the drive arm right and cassette ON cam, fit it on the right side plate. Similarly, fit the drive arm left onto the left side plate.
❸ Similarly, while passing the positioning rod through the worm wheel, fit the latter onto the right side plate.
❹ Similarly, while passing the positioning rod through the combination of the limiter gear and cassette OFF cam, fit it onto the right side plate. plate.

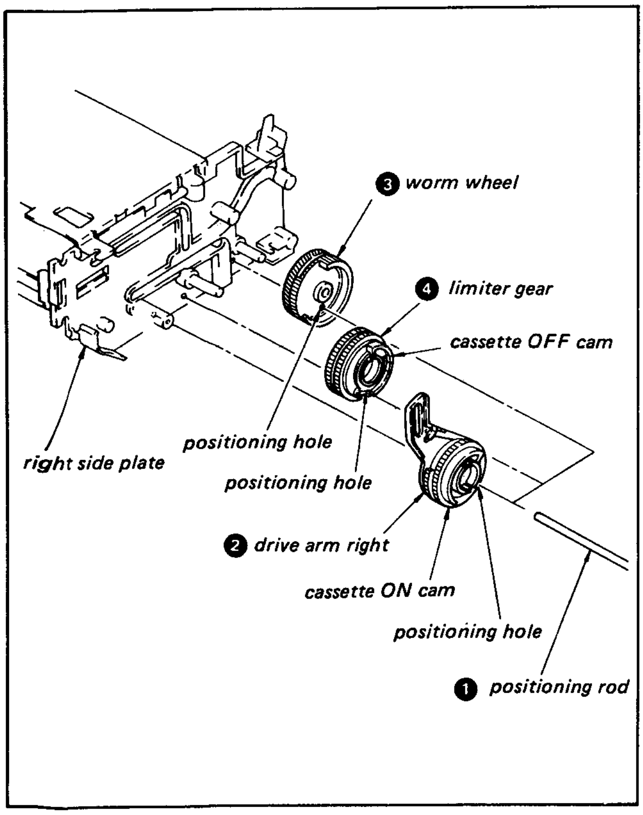


Fig. 3-12. Positioning of the FL cassette compartment gears

3-7-2. Cassette OFF Switch Operation Check and Adjustment

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly, confirm that, as the cassette is inserted, the microswitch comes ON when the center of the drive roller is 0 to 5 mm from the end of the guide groove, as shown in Fig. 3-13. (The switch lever will be restored to its original position, making a clicking sound.)

[Method of adjustment]

Loosen the screw that holds the cassette OFF cam attached to limiter gear A in place, move the cassette OFF cam in the direction of the arrow, adjust so that the cassette OFF switch comes ON when the above distance is 0 to 5 mm, and finally tighten the screw.

* When the cassette ON switch and cassette OFF switch operate, the threading motor comes ON.

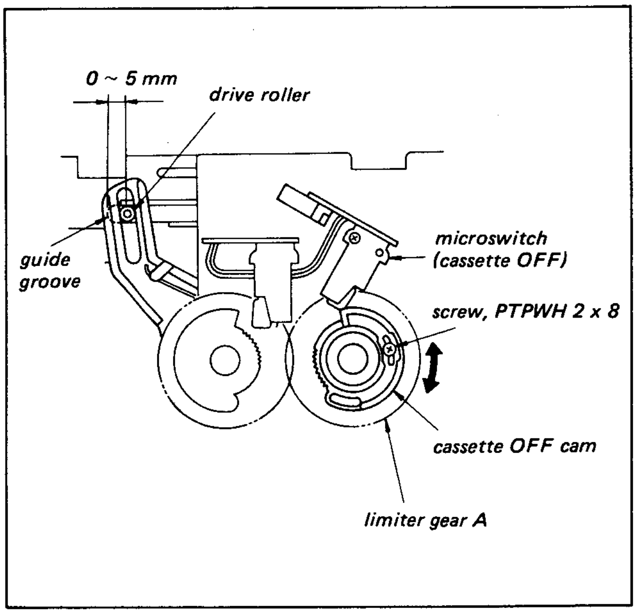


Fig. 3-13. Cassette OFF switch operation check and adjustment

3-7-3. Cassette ON Switch Operation Check and Adjustment

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly, confirm that, as the cassette is inserted, the microswitch comes ON when the center of the drive roller is 10 to 12 mm from the end of the guide groove, as shown in Fig. 3-14. (A clicking sound can be heard after the switch is pressed.)

[Method of adjustment]

Loosen the screw that holds the cassette ON cam attached to the drive gear in place, then move the cassette ON cam in the direction of the arrow.
Adjust so that the cassette ON switch comes ON when the above distance is 10 to 12 mm, and finally tighten the screw.

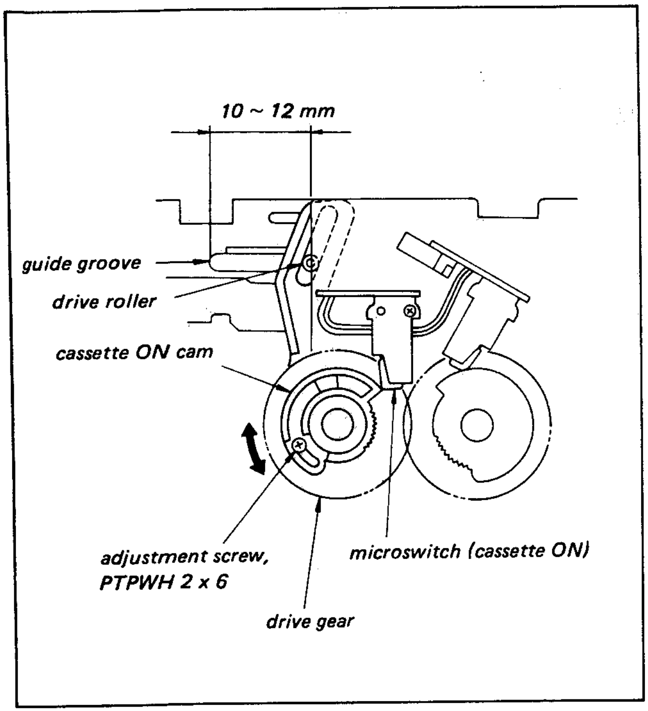

10 ~ 12 mm
guide groove
drive roller
cassette ON cam
adjustment screw, PTPWH 2 x 6
microswitch (cassette ON)
drive gear

Fig. 3-14. Cassette ON switch operation check and adjustment

3-7-4. Checking and Adjustment of the Cassette Door Assembly

[Method of checking]

With the door opening and closing arm returned all the way in the direction of arrow Ⓐ, check to make sure that the upper and lower doors are vertical.

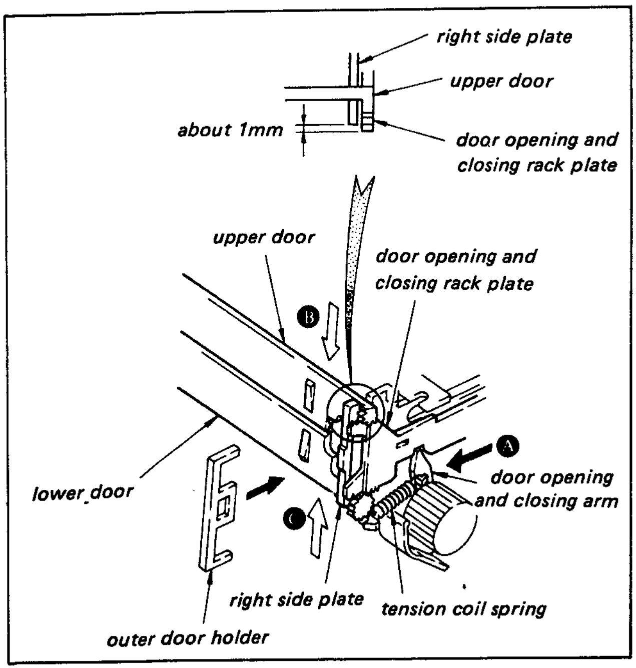

right side plate
upper door
about 1mm
door opening and closing rack plate
upper door
door opening and closing rack plate
Ⓑ
Ⓐ
door opening and closing arm
lower door
Ⓒ
right side plate
tension coil spring
outer door holder

Fig. 3-15. Adjustment of the position of the cassette door assembly

[Method of adjustment]

Check to make sure that the door opening and closing rack plate has returned all the way. Then, with the tip of the door opening and closing rack plate and the tip of the right side plate about 1 mm apart, close the upper and lower doors together in the directions of arrows Ⓑ and Ⓒ so that they are vertical, and mesh the gears. Fit the outer door holder onto the right side plate, and fix the upper and lower doors in place.

3-7-5. Mounting the FL Cassette Compartment Assembly (Fig. 3-16)

❶ Hook the two claws of the FL cassette compartment assembly onto the mechanical chassis, then place the compartment in the specified position on the chassis.

❷ Loosely tighten the 5 mounting screws of the FL cassette compartment assembly. Move the FL cassette compartment assembly forward and backward with respect to the mechanical chassis, set it in the correct position, then tighten the mounting screws all the way.

❸ Connect the synchro belt (loading belt) between the threading motor and the worm gear, then hold it in place with the internal gear flange.

❹ Press the tension roller arm in the direction of the arrow to adjust the tension of the synchro belt (loading belt), then fix it in place with the arm fixing screw.

❺ Insert the harness sticking out from the main body into connector CN301 on CS-3 board.

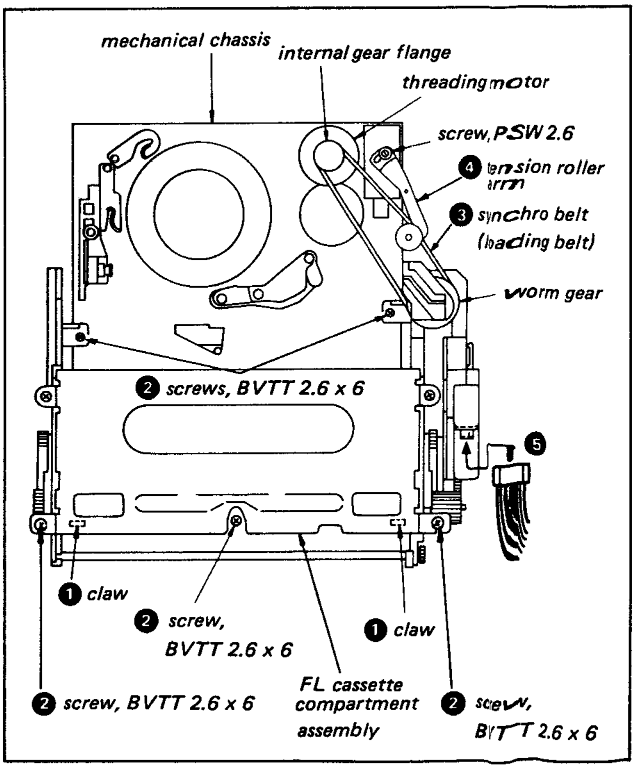
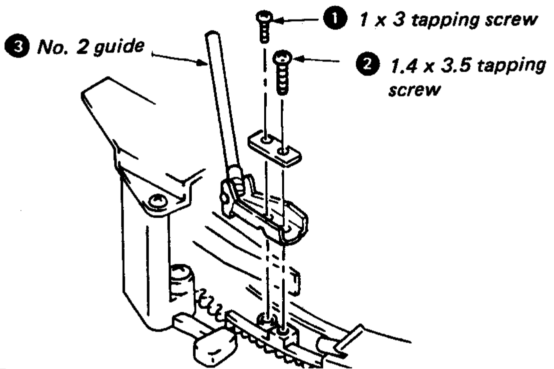

mechanical chassis
internal gear flange
threading motor
screw, PSW 2.6
❹ tension roller arm
❸ synchro belt (loading belt)
worm gear
❷ screws, BVTT 2.6 x 6
❺
❶ claw
❷ screw, BVTT 2.6 x 6
❶ claw
❷ screw, BVTT 2.6 x 6
FL cassette compartment assembly
❷ screw, BVTT 2.6 x 6

Fig. 3-16. Mounting the FL cassette compartment assembly

3-8. REMOVAL OF THE No. 2 AND No. 3 GUIDES

3-8-1. Removal of the No. 2 Guide

❶ Remove the 1x3 tapping screw.
❷ Remove the 1.4x3.5 tapping screw.
❸ Remove the No. 2 guide assembly.


❸ No. 2 guide
❶ 1 x 3 tapping screw
❷ 1.4 x 3.5 tapping screw

<To remount>

1) *Loosely tighten the 1 x 3 tapping screw.*
2) *Tighten the 1.4 x 3.5 tapping screw all the way.*
3) *Adjust the 1 x 3 tapping screw until the height is 35 mm. After adjustment, lock the screw.*
   Note: The No. 2 guide is up all the way.

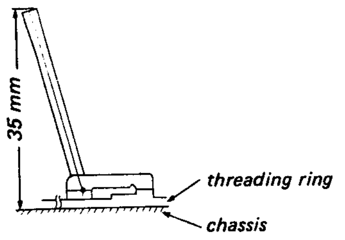
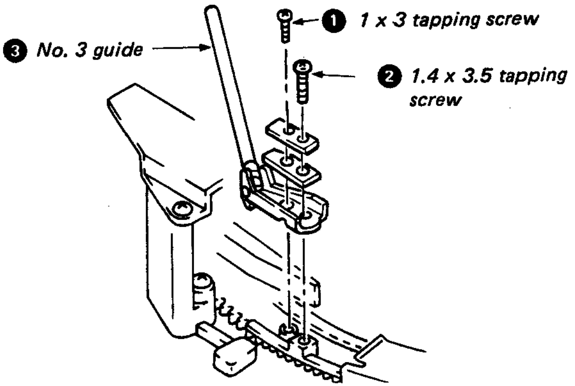

35 mm
threading ring
chassis

Fig. 3-17. Removal of the no. 2 guide

3-8-2. Removal of the No. 3 Guide

❶ Remove the 1x3 tapping screw.
❷ Remove the 1.4x3.5 tapping screw.
❸ Remove the No. 3 guide assembly.


❸ No. 3 guide
❶ 1 x 3 tapping screw
❷ 1.4 x 3.5 tapping screw

<To remount>

1) *Loosely tighten the 1 x 3 tapping screw.*
2) *Tighten the 1.4 x 3.5 tapping screw all the way.*
3) *Adjust the 1 x 3 tapping screw so that the height is 30 mm. After adjustment, lock the screw.*
   Note: The No. 3 guide is up all the way.

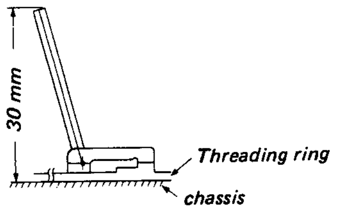

30 mm
Threading ring
chassis

Fig. 3-18. Removal of the no. 3 guide

3-9. REPLACEMENT AND ADJUSTMENT OF THE S THREADING RING

3-9-1. Preparation to Remove the S Threading Ring Removal of the ACE Assembly, FE Head and Threading Motor (Fig. 3-19)

❶ Remove the cross-recessed head screw.
❷ Remove the No. 6 guide nut.
❸ Remove the No. 6 washer.
❹ Remove the No. 6 guide spacer.
❺ Remove the compression coil spring.
❻ Remove the 2 guide adjustment nuts, then remove the ACE assembly and the FE head.

Note:
Since the ACE assembly and the FE head are connected by a lead wire, be careful when removing them. It is not necessary to remove the compression coil spring below the ACE assembly, but be careful not to lose it.

❼ Remove the two PSW2.6 screws, then remove the stopper arm section.
❽ Remove the 2 screws, then remove the threading motor assembly by pulling it up and out.

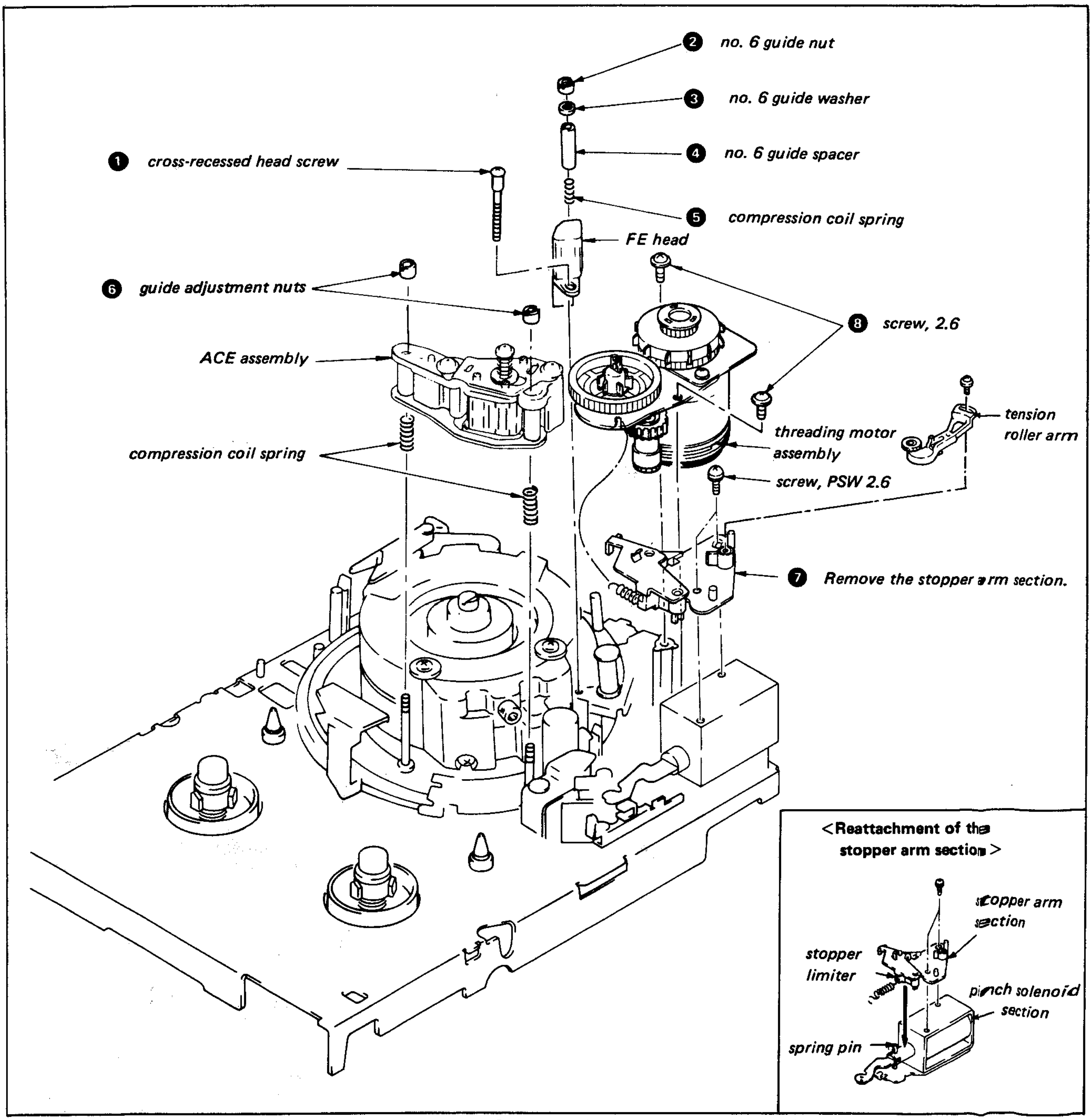

❷ no. 6 guide nut
❸ no. 6 guide washer
❹ no. 6 guide spacer
❶ cross-recessed head screw
❺ compression coil spring
FE head
❻ guide adjustment nuts
❽ screw, 2.6
ACE assembly
tension roller arm
threading motor assembly
compression coil spring
screw, PSW 2.6
❼ Remove the stopper arm section.
<Reattachment of the stopper arm section>
stopper arm section
stopper limiter
pinch solenoid section
spring pin

Fig. 3-19. Removal of the ACE assembly, FE head and threading motor.

Removal of Miscellaneous Parts (Fig. 3-20)

Proceeding in the same manner as in replacement of the drum assembly, measure the width of the gap between the upper drum and the adjust plates (Fig. 3-5).

❶ Remove the screw, then remove the tape guide ground plate and adjust plates 1 and 2.

❷ Remove the two screws, then remove the tape holder assembly.

❸ Remove the screw, then remove the guide plate.

❹ Remove the 2 PTPWH2×8 screws and the 2.6×24 screw, then remove shuttle guide II.

❺ Remove the 3 PTPWH2×8 screws and the 2.6×24 screw. Then remove the 2 claws holding shuttle guide I in place, and finally remove shuttle guide I.

❻ Remove the slant base assembly.

❼ Remove the BVTT2.6×6 screw, then remove the pinch liner link.

Note:

After removing the guide plate, do not thread or unthread a tape with the shuttle guide mounted.

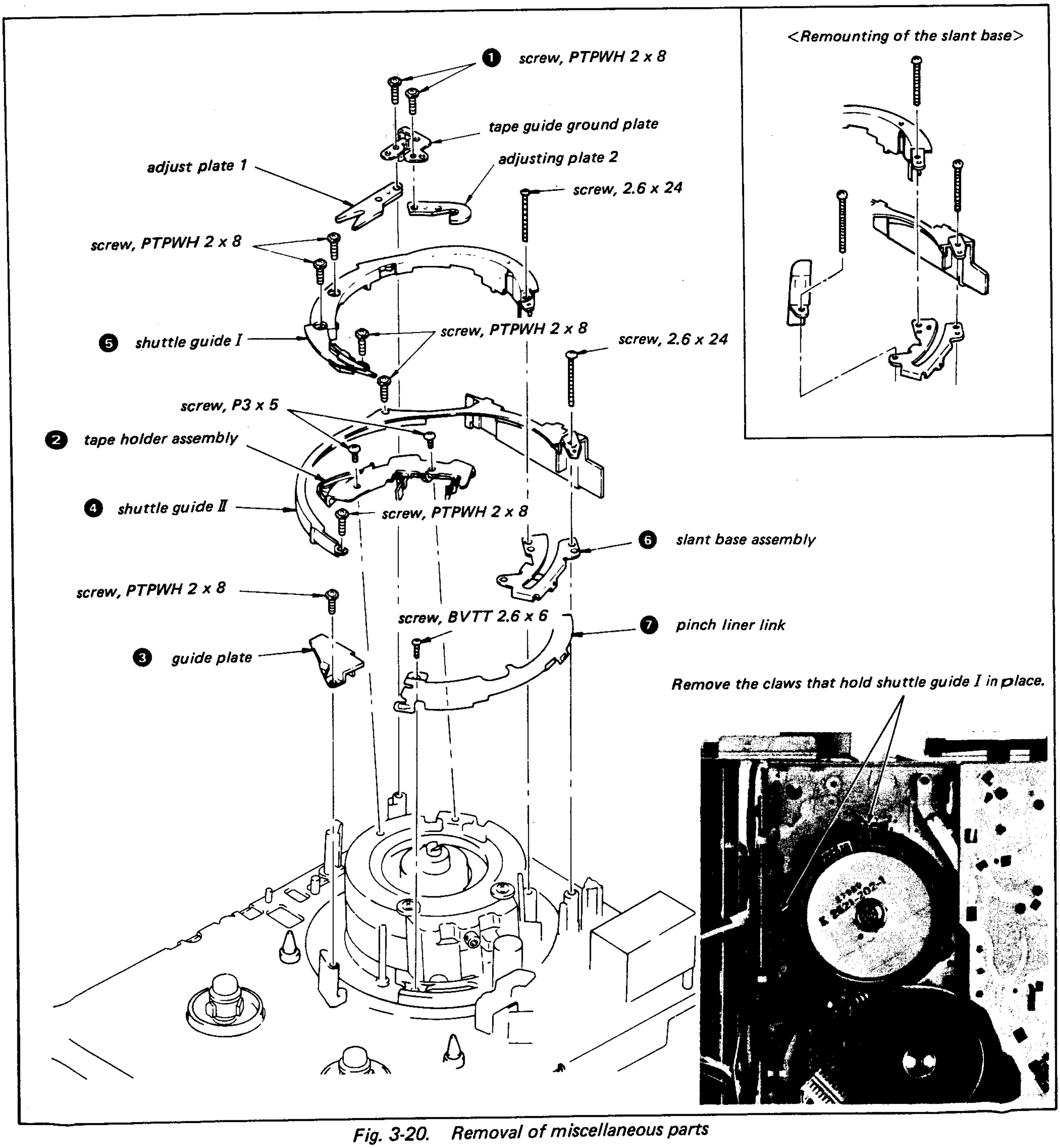

❶ screw, PTPWH 2 x 8
tape guide ground plate
adjust plate 1
adjusting plate 2
screw, 2.6 x 24
screw, PTPWH 2 x 8
❺ shuttle guide I
screw, PTPWH 2 x 8
screw, 2.6 x 24
screw, P3 x 5
❷ tape holder assembly
❹ shuttle guide II
screw, PTPWH 2 x 8
❻ slant base assembly
screw, PTPWH 2 x 8
screw, BVTT 2.6 x 6
❼ pinch liner link
❸ guide plate
<Remounting of the slant base>
Remove the claws that hold shuttle guide I in place.

Fig. 3-20. Removal of miscellaneous parts

3-9-2. Removal of the S Threading Ring (Fig. 3-21)

❶ Remove the tension coil spring from the lock arm assembly (refer to Fig. 3-26 in section 3-11-1).
❷ Remove the washer and remove the ring roller (B).
❸ Remove the group of parts in the unthreading end switch (for instructions on assembly and disassembly, refer to section 3-11-2 and Fig. 3-30).
❹ Remove the screw, then remove the ring roller adjustment plate.
❺ Remove the S threading ring.

Note:
Once the washer has been removed, do not use it again.

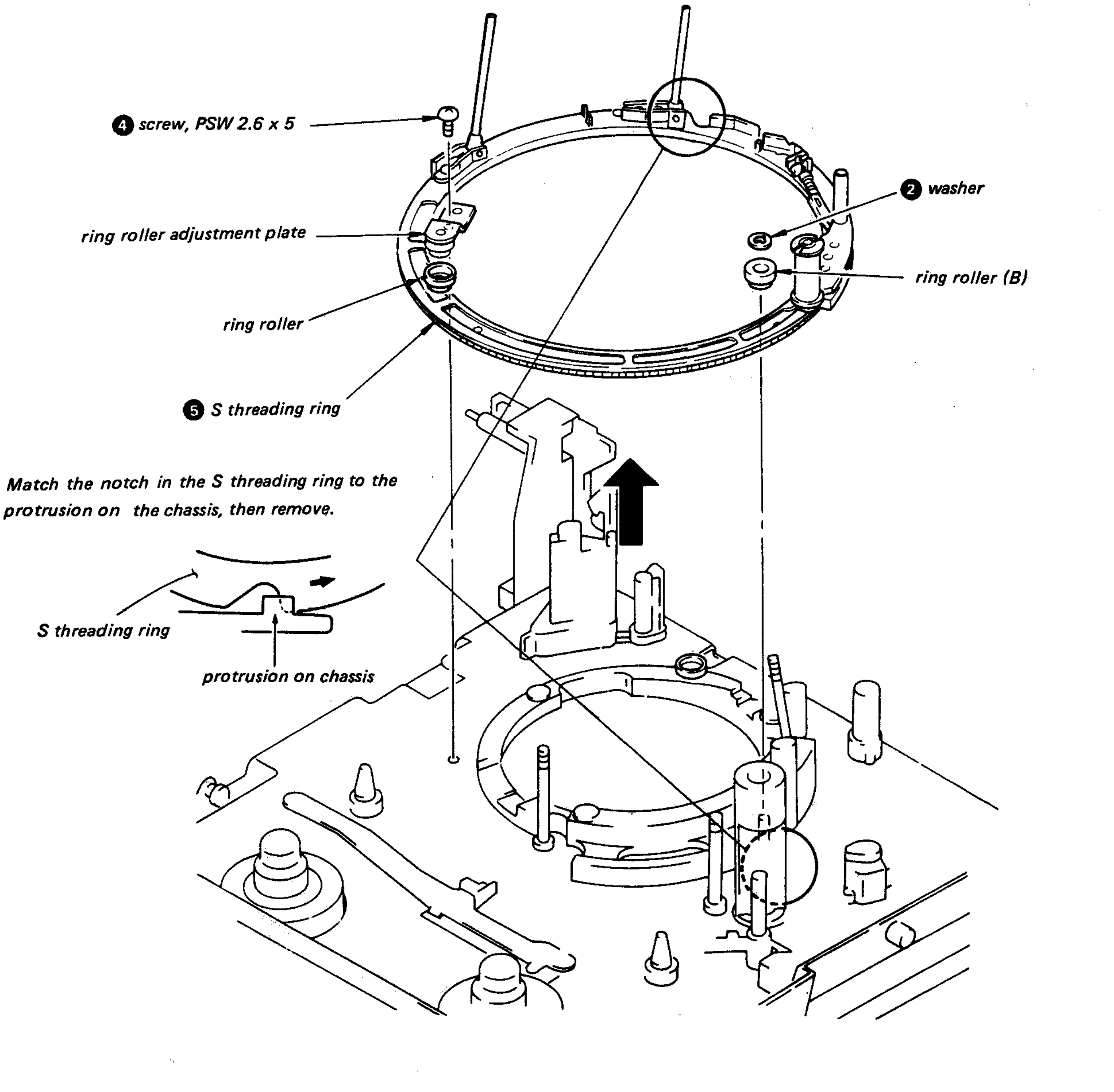

❹ screw, PSW 2.6 x 5
ring roller adjustment plate
ring roller
❺ S threading ring
❷ washer
ring roller (B)
Match the notch in the S threading ring to the protrusion on the chassis, then remove.
S threading ring
protrusion on chassis

Fig. 3-21. Removal of the S threading ring

3-9-3. Slider-Stopper Mounting Check (Fig. 3-22)

❶ Confirm that the parts of the drive gear are fixed in place.

❷ Loosen the screw, insert a spacer of thickness 0.2 mm between the slider gear assembly and the slider stopper, and tighten the screw while pressing down in the direction of both arrows Ⓐ and Ⓑ.

Note:

It is absolutely necessary to press down in the direction of arrow (A) in order to eliminate play. When the screw is tightened, the slide stopper tends to turn in the direction of arrow (a), so it should be held in place with a blade screwdriver while tightening the screw.

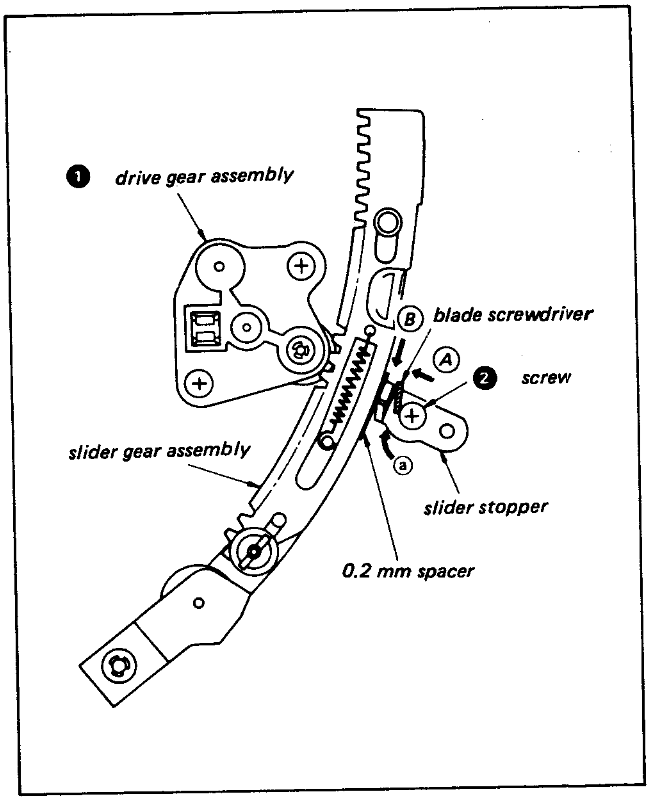

❶ drive gear assembly
Ⓑ blade screwdriver
Ⓐ
❷ screw
slider gear assembly
ⓐ
slider stopper
0.2 mm spacer

Fig. 3-22. Mounting the slider-stopper

3-9-4. S Threading Ring Mounting and Position Adjustment (Fig. 3-23)

❶ Set the slider gear assembly in the unthreading completed position.
(Insert a spacer of thickness 0.5 mm between the slider stopper and slider gear, and set so that it is up against section Ⓐ.)

❷ In this condition, fit the threading ring into place, match the chassis hole (3ϕ) of section Ⓑ with the S threading ring hole (1.5ϕ), and mesh with the drive gear teeth.

❸ Attach ring roller (B) and fix in place with a washer.

❹ Attach the ring roller, and fix in place with the adjustment plate.

Note:

After replacement and mounting are completed, adjust the ACE assembly as explained in the section on tape path adjustment.

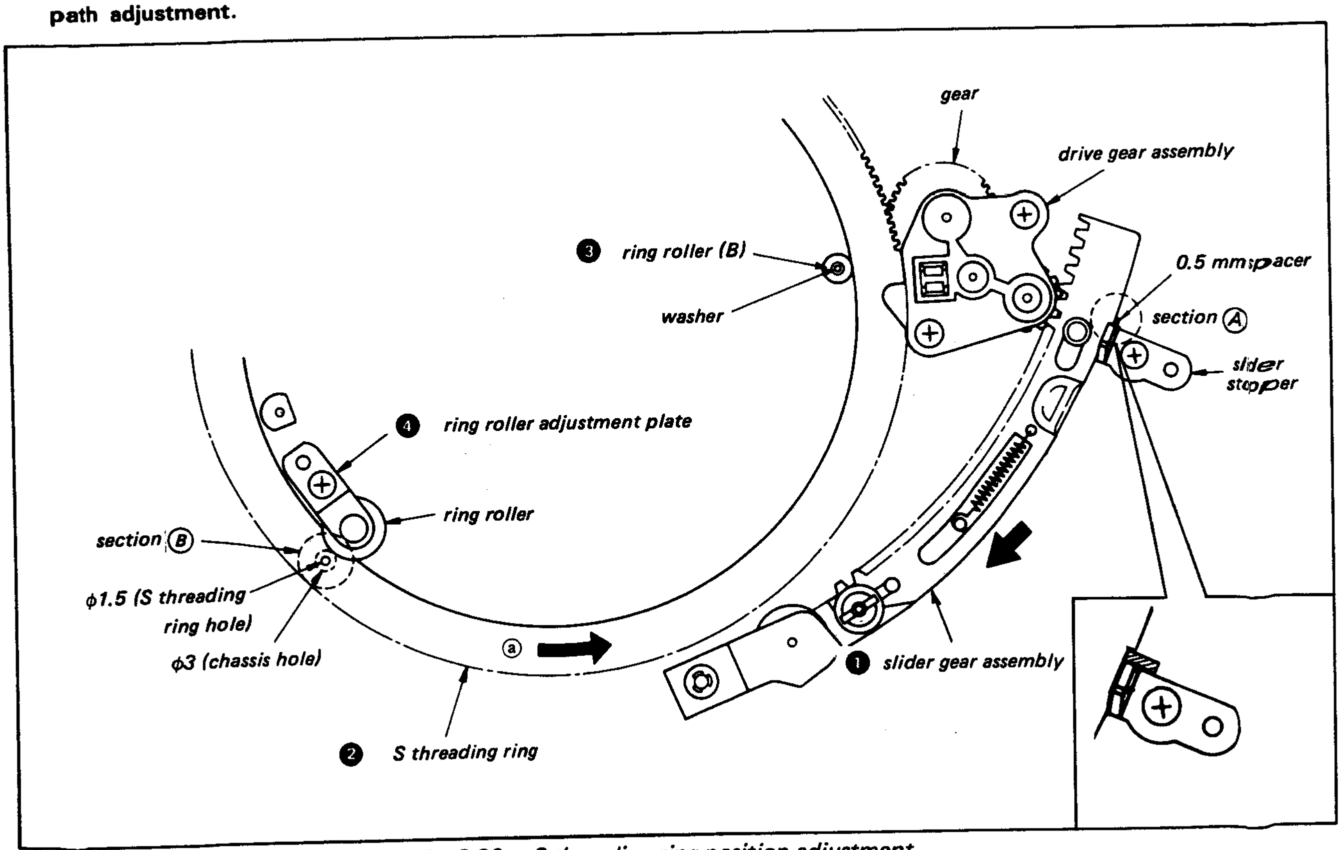

gear
drive gear assembly
❸ ring roller (B)
washer
0.5 mm spacer
section Ⓐ
slider stopper
❹ ring roller adjustment plate
ring roller
section Ⓑ
ϕ1.5 (S threading ring hole)
ϕ3 (chassis hole)
ⓐ
❶ slider gear assembly
❷ S threading ring

Fig. 3-23. S threading ring position adjustment

3-10. PINCH SNAP-FIT LIMITER GAP CHECK AND ADJUSTMENT

[Method of checking]

1) Set in the threading completed condition.
2) With the plunger pushed in all the way, confirm that the thickness of the pinch snap-fit limiter gap is 0.4 mm to 0.6 mm. If it is not, adjust as explained under [method of adjustment] below.

[Method of adjustment]

❶ With the pinch solenoid in the absorbed condition (when the plunger is pushed in all the way), loosen the adjustment screw.

❷ Press the pinch limiter adjustment plate in the direction of arrow ⓐ with a blade screwdriver, as in section Ⓐ in the diagram, and adjust until the thickness of the gap is 0.4 mm to 0.6 mm.
Tighten the adjustment screw and then lock it to fix everything in place.

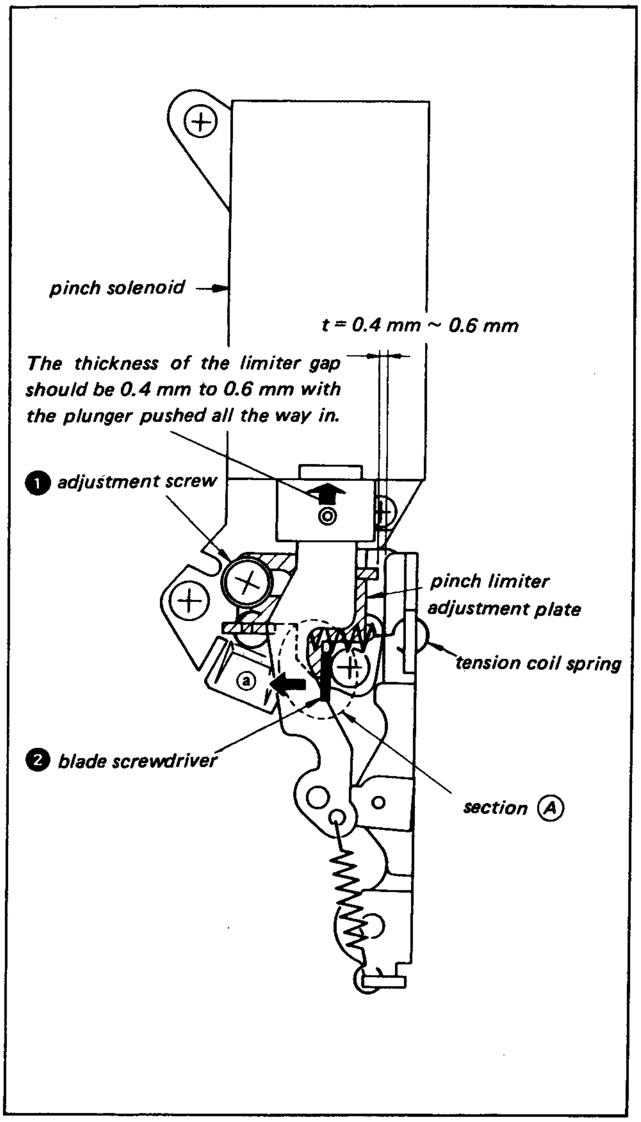

pinch solenoid
t = 0.4 mm ~ 0.6 mm
The thickness of the limiter gap should be 0.4 mm to 0.6 mm with the plunger pushed all the way in.
❶ adjustment screw
pinch limiter adjustment plate
tension coil spring
ⓐ
❷ blade screwdriver
section Ⓐ

Fig. 3-24. Pinch snap-fit limiter gap adjustment plate

3-11. MICROSWITCH POSITION CHECK AND ADJUSTMENT

3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually. Check to make sure that, when the lock roller moves from above the straight line part of the notch in the ring (Fig. 3-25 section Ⓐ) to 2/3 of the way down it and back, the TE switch turns ON and OFF. This can be confirmed from the clicking sound.
If the lock roller has to move outside of this range before the switch will turn ON and OFF, adjust as explained below.

[Method of adjustment]

1) Set the lock roller at 2/3 of the way from the top of the notch in the S threading ring, turn the cam shaft in the direction of the arrow with a blade screwdriver and, when the switch turns ON (with a clicking sound), fix the cam shaft in place.
2) When the adjustment is completed, repeat the check as described under [method of checking].

[Removal]

❶ Remove the tension coil spring that is attached to the lock arm assembly.
❷ Remove the screw, then remove the TE switch assembly.
❸ Press the claws holding the main chassis assembly in place in the direction of arrow Ⓐ to release the lock, then remove the lock arm assembly.

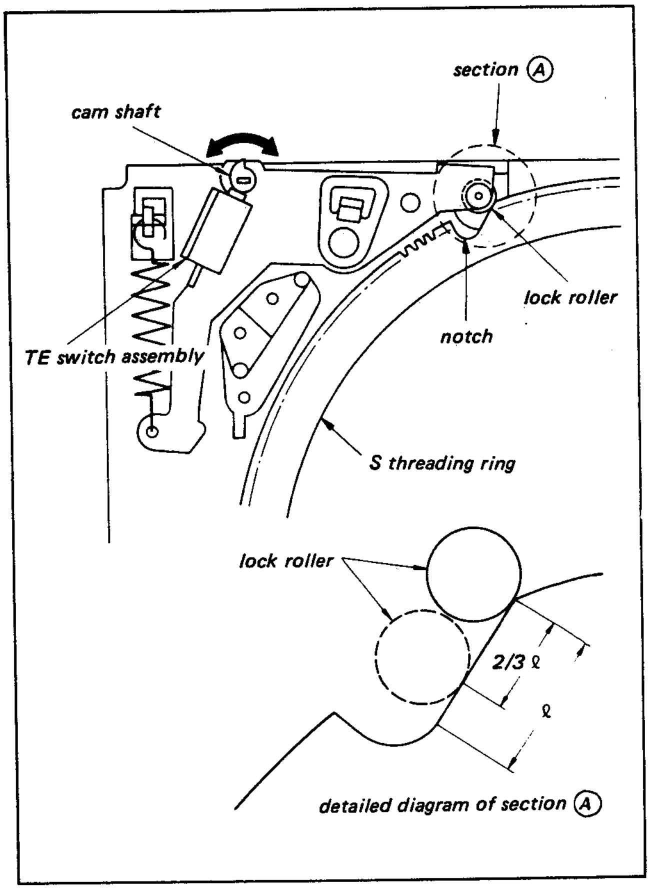

section Ⓐ
cam shaft
lock roller
notch
TE switch assembly
S threading ring
lock roller
2/3 ℓ
ℓ
detailed diagram of section Ⓐ

Fig. 3-25. TE switch position adjustment

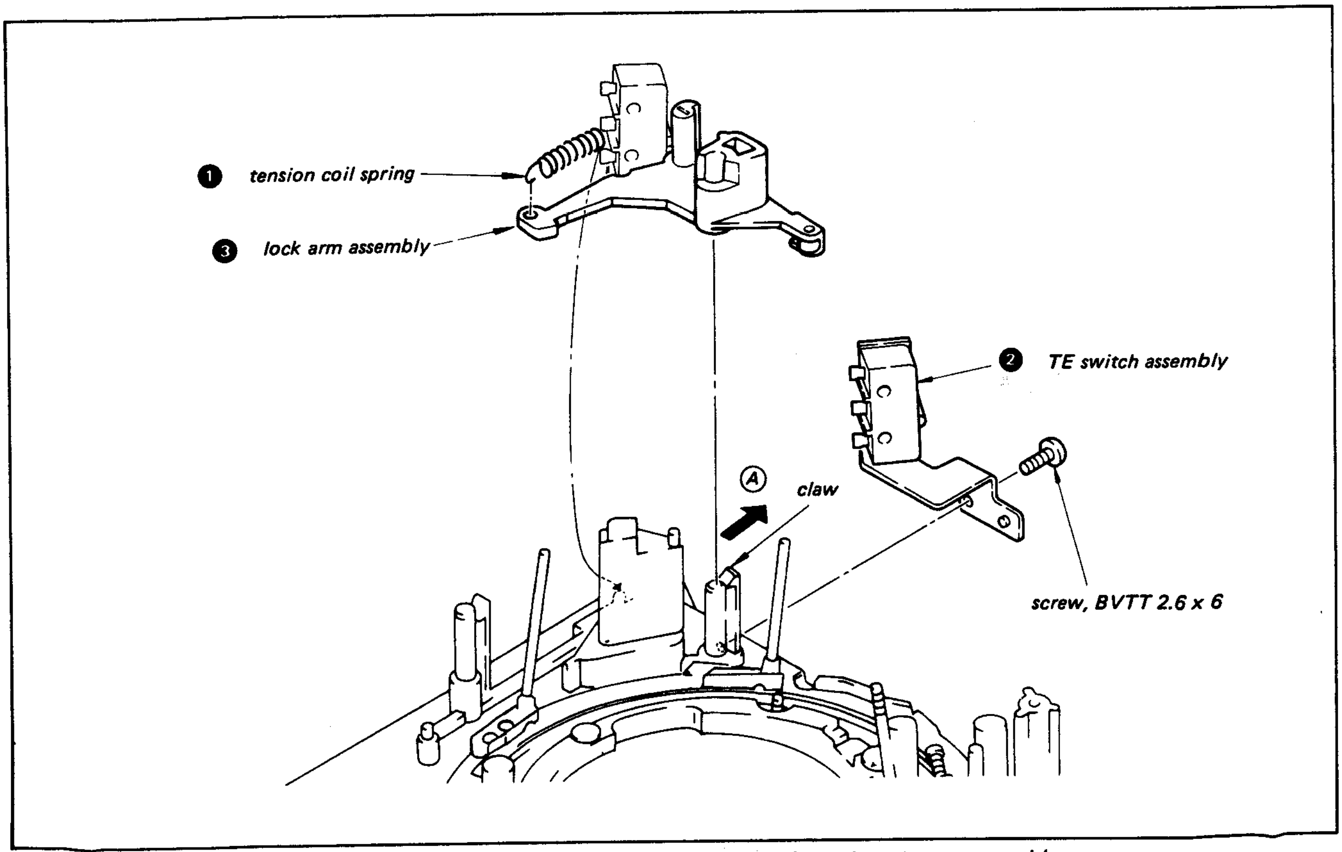

❶ tension coil spring
❸ lock arm assembly
❷ TE switch assembly
Ⓐ
claw
screw, BVTT 2.6 x 6

Fig. 3-26. Removal of the TE switch assembly and lock arm assembly

3-11-2. Unthreading End Switch (UTE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually until the UTE switch roller of the UTE switch arm assembly drops into the UTE switch arm groove. Confirm that when a ϕ1.2 pin is inserted into section Ⓐ in Fig. 3-27, the switch comes ON, and that when a ϕ0.6 pin is inserted the switch does not come ON.

[Method of adjustment]

1) If the switch fails to come ON when a ϕ1.2 pin is inserted, loosen small screw ❶ and adjust by turning a little at a time in the direction of arrow Ⓑ.
2) If the switch comes ON when a ϕ0.6 pin is inserted, it is possible that the actuator is bent as shown in Fig. 3-28. Check it and straighten it out if necessary.

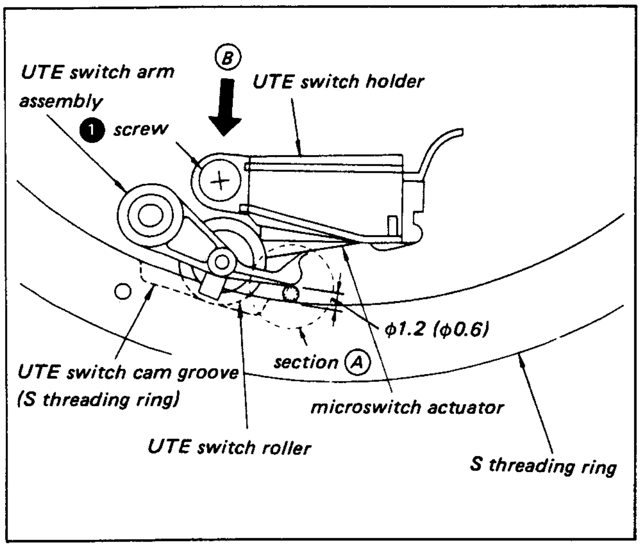

UTE switch arm assembly
Ⓑ
UTE switch holder
❶ screw
ϕ1.2 (ϕ0.6)
section Ⓐ
UTE switch cam groove (S threading ring)
microswitch actuator
UTE switch roller
S threading ring

Fig. 3-27. UTE switch position adjustment

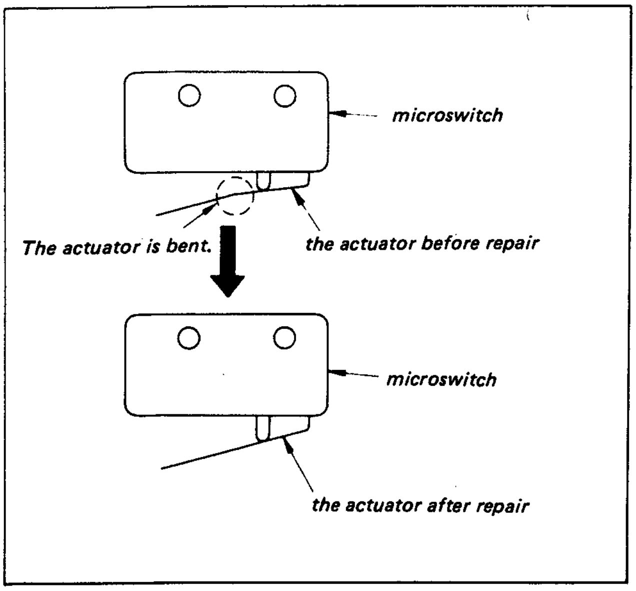

microswitch
The actuator is bent.
the actuator before repair
microswitch
the actuator after repair

Fig. 3-28. Repair of the actuator

Note:

The ϕ1.2 and ϕ0.6 pins must be inserted in the right place, as shown in Fig. 3-29. (As shown in Fig. 3-29, depending on where the pin is inserted, because of the structure of the assembly, even if it enters at 1.2 mm the gap can be less than 1.2 mm farther in).

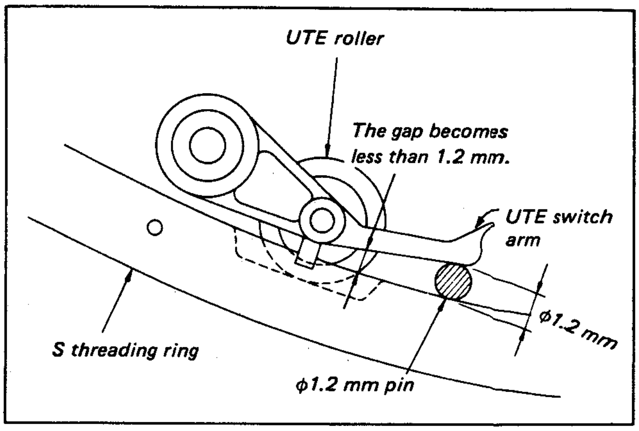

UTE roller
The gap becomes less than 1.2 mm.
UTE switch arm
ϕ1.2 mm
S threading ring
ϕ1.2 mm pin

Fig. 3-29. Position of the pin when checking

[How to remove]

❶ Remove the screw, as shown in Fig. 3-30.
❷ Remove the claw of the switch from the chassis, and then remove the main body of the switch while holding the actuator in the ON position.

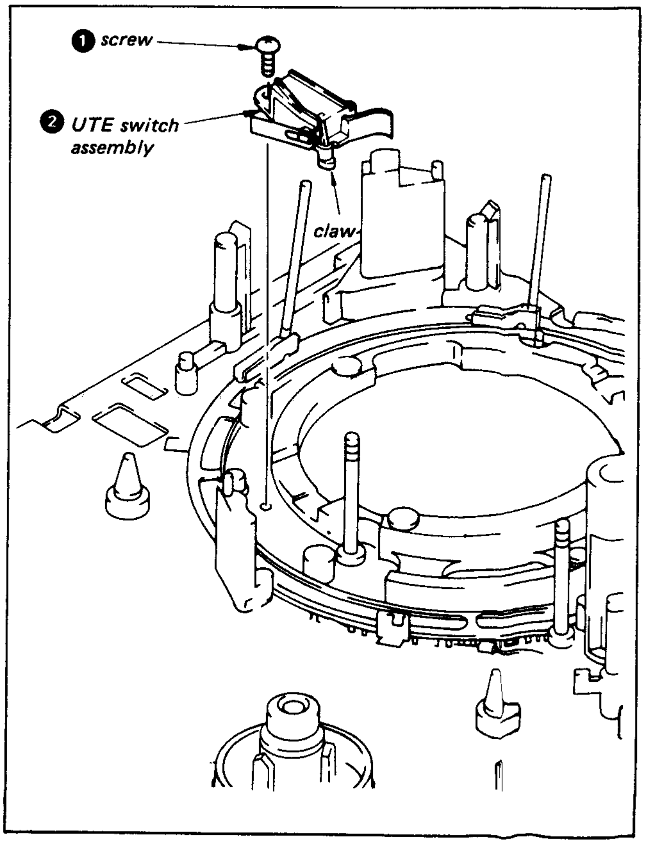

❶ screw
❷ UTE switch assembly
claw

Fig. 3-30. Removal of the UTE switch

3-12. REMOVAL AND ADJUSTMENT OF THE REEL MOTOR SECTION

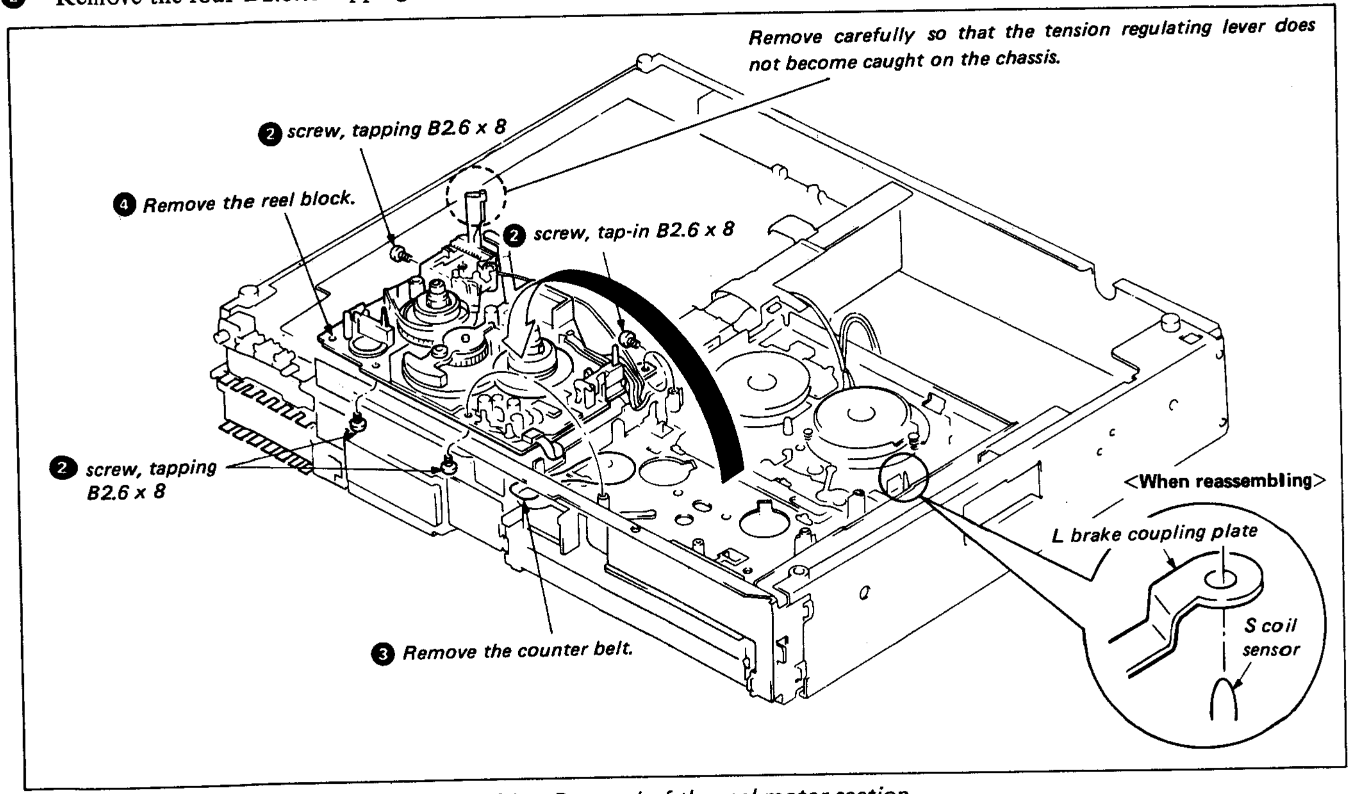
3-12-1. Removal of the Reel Motor Section

❶ Turn the unit so that the top surface of the main body faces down.

❷ Remove the four B2.6x8 tapping screws.

❸ Remove the counter belt.

❹ Remove the reel block.



Remove carefully so that the tension regulating lever does not become caught on the chassis.

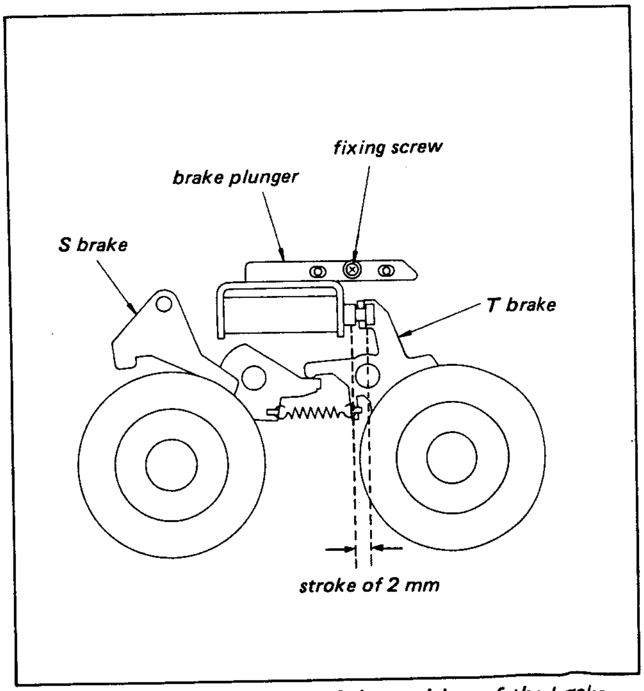
❷ screw, tapping B2.6 x 8
❹ Remove the reel block.
❷ screw, tap-in B2.6 x 8
❷ screw, tapping B2.6 x 8
❸ Remove the counter belt.
<When reassembling>
L brake coupling plate
S coil sensor

Fig. 3-31. Removal of the reel motor section

3-12-2. Adjustment of the Brake Plunger

1) Loosen the brake plunger fixing screw.
2) More the brake plunger in the direction of the arrow, and tighten the fixing screw just enough so that the plunger can move through a stroke of 2 mm.

Note:
The plunger should be 2 mm away from contact with the T brake.



fixing screw
brake plunger
S brake
T brake
stroke of 2 mm

Fig. 3-32. Adjustment of the position of the brake plunger

3-12-3. Adjustment of the Soft Brake

[Method of checking]

1) Remove the cassette compartment section, and put the unit in the threaded state without a cassette.
2) As shown in Fig. 3-33, set a tension gauge (SL-0011) on the S reel table.
3) Set the unit in fast forward mode (free the S reel table), and pull the sector type gauge slowly.
4) Confirm that the reading of the sector type gauge is 8g.

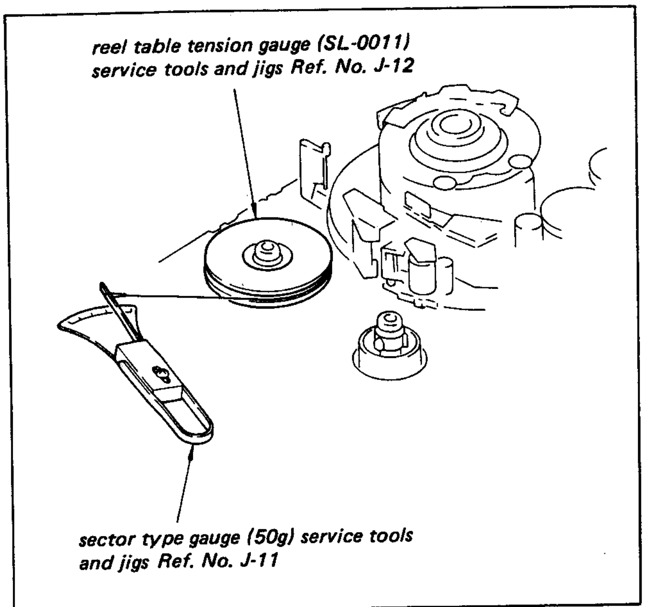

reel table tension gauge (SL-0011)
service tools and jigs Ref. No. J-12
sector type gauge (50g) service tools
and jigs Ref. No. J-11

Fig. 3-33. How to check the soft brake

[Method of adjustment]

1) Adjust the position of the soft brake lever tension coil spring.

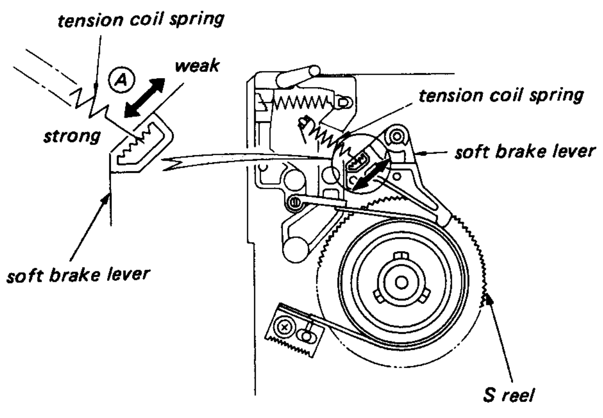

tension coil spring
Ⓐ
weak
strong
soft brake lever
tension coil spring
soft brake lever
S reel

Fig. 3-34. Adjustment of the soft brake

3-12-4. Adjustment of the Position of the Tension Regulating Lever

[Method of adjustment]

1) Put the unit in playback mode.
2) Loosen the adjustment spring until the tape guide pin of the tension regulating lever assembly is positioned to the outside of the outer circumference of shuttle guide 2, as shown in Fig. 3-35. Then adjust by moving the tension regulating band assembly in the direction of arrow Ⓐ.
3) After adjustment, tighten the adjustment screw, being careful that the tension regulating band assembly does not move.

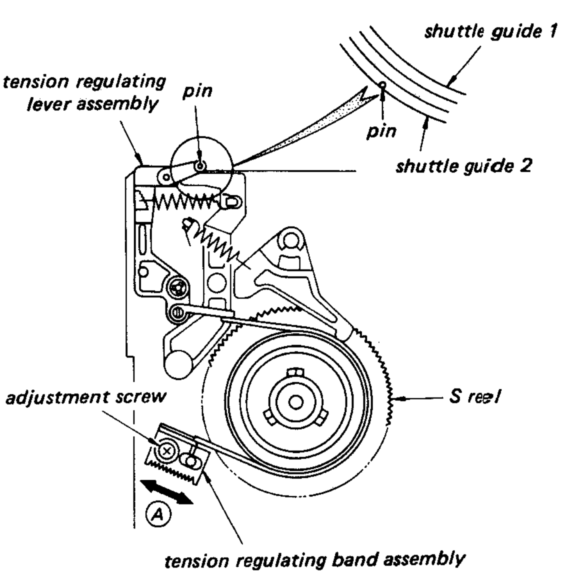

shuttle guide 1
tension regulating lever assembly
pin
pin
shuttle guide 2
adjustment screw
S reel
Ⓐ
tension regulating band assembly

Fig. 3-35. Adjustment of the position of the tension regulating lever

3-13. ADJUSTMENT OF THE FORWARD AND BACK TENSION

Use a torque cassette (SL-0003C) for SL-2410/2415 forward and back tension measurement.

[Method of measurement]

1) Connect TP601 and TP602 on both sides of R608 on the SS-13 board to short them and stop the rotation detection.
2) Insert the torque cassette (SL-0003C) and put the unit in playback mode.
3) Read the value on the meter on the S reel side after the needle has gone around about once.
   The correct value is 30 g·cm ± 5 g·cm.

Notes:

i) The set must be perfectly level during this measurement.

ii) After the measurement, the tape can become slack when the stop button is pressed. If this happens, set the unit in forward mode to take up the slack before removing the tape.

[Method of adjustment]

Move the position of the tension coil spring that is hooked on the tension regulating lever assembly in the direction of arrow Ⓐ until the measured value falls within the correct range.

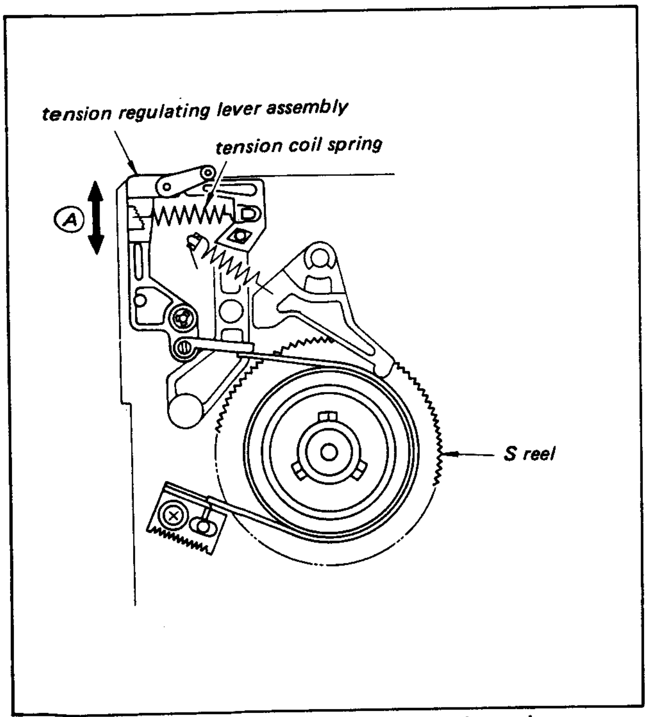


Fig. 3-36. Adjustment of the back tension

3-14. ADJUSTMENT OF THE FORWARD TORQUE

Use a torque cassette (SL-0003C) for SL-2410/2415 forward torque measurement.

[Method of measurement]

1) Connect TP601 and TP602, on both ends of R608, to short them and stop the rotation detection.
2) Insert the torque cassette (SL-0003C) and start to record a TV broadcast in βII mode.
3) Read the value on the meter on the T reel side after the needle has gone around about once. The correct range is 80g·cm ± 5g·cm.

[Method of adjustment]

1) Remove the front panel.
2) Turn variable resistor RV201 on FS-28 board to adjust the torque until its value falls within the correct range.

Note:

When the forward torque is weakened during the measurement the tape can become slack, in which case the set will go into emergency stop mode. In such a case, the only switches that will work are the cassette eject switch and the power switch. It is necessary to temporarily remove the cassette, or to turn the power OFF and back ON.

SECTION 4
TAPE PATH ADJUSTMENT

4-1. TRACKING ADJUSTMENT

This adjustment has a large effect on the picture quality in each mode and on the interchangeability of tapes, so it should be done carefully.

4-1-1. Preparation for adjustment
4-1-2. Adjustment on the entrance side
4-1-3. Adjustment on the exit side

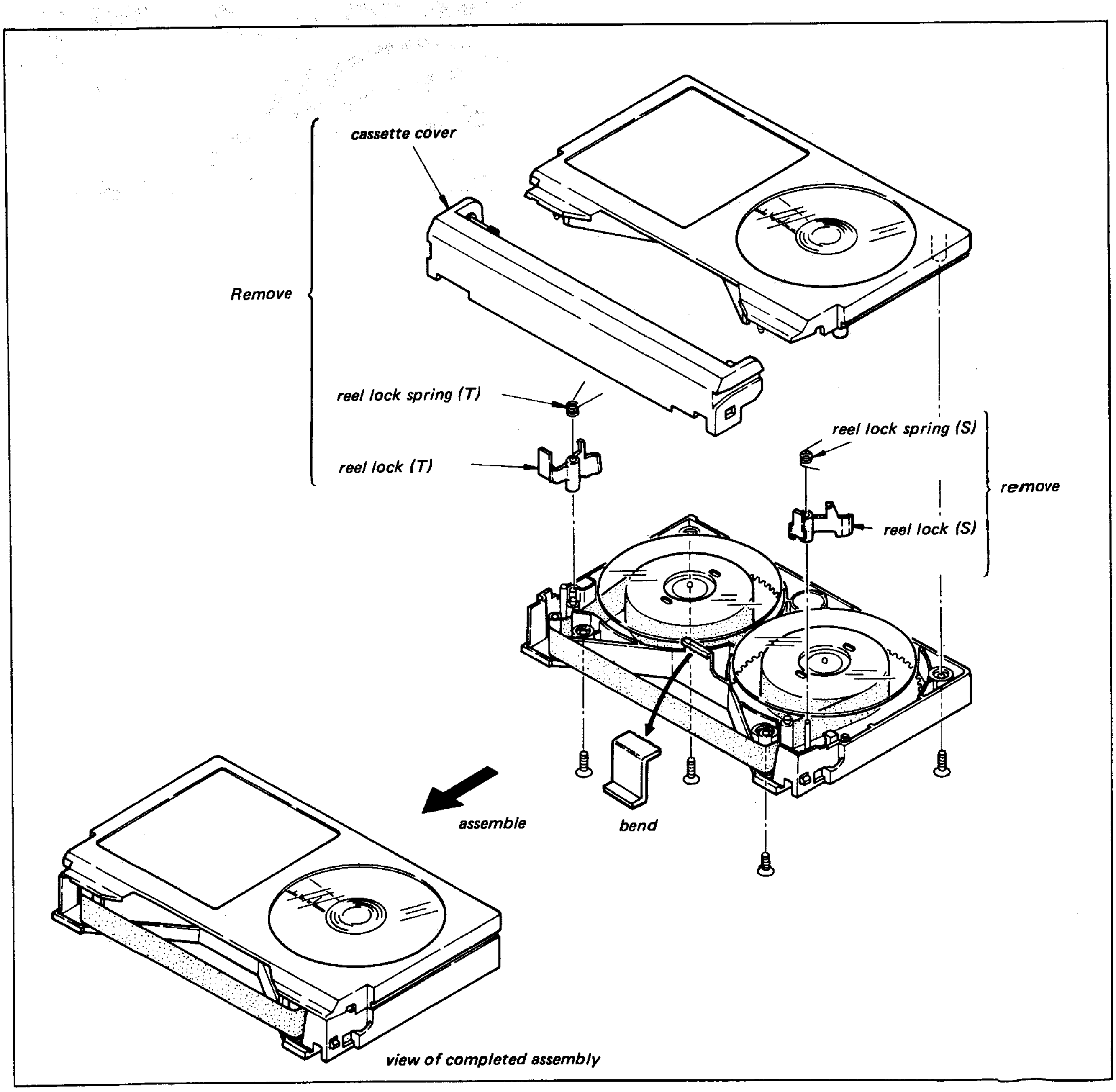
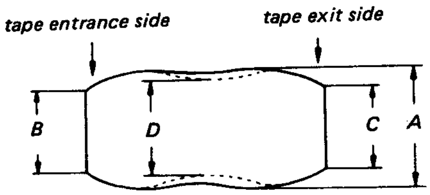

cassette cover
Remove
reel lock spring (T)
reel lock (T)
reel lock spring (S)
remove
reel lock (S)
assemble
bend
view of completed assembly

Fig. 4-1.

4-1-1. Preparation for Adjustment

1) Remove the cassette cover of the alignment tape in accordance with Fig. 4-1.
2) Clean the surfaces contacted by the traveling tape (tape guide, drum tape traveling surface, capstan shaft. pinch roller, ACE.FE head surface) with a chamois cloth dipped in methanol.
3) Connect the oscilloscope as follows:
   channel 1: CN3-pin ⑤ (RP-8 board)
   external trigger: CN3-pin ③ (RP-8 board)
4) Play back the 1 kHz signal on the tracking section of the alignment tape.
5) Confirm that the oscilloscope RF output waveform is flat and that the amplitude is maximum.
   (Turn the tracking knob right and left to increase and decrease the amplitude while the waveform remains flat.)
   When the amplitude of the waveform is maximum, confirm that the fluctuations and contact of the RF output waveform meet the standards given in Fig. 4-2. If they do not, go through the procedure given in step 6).
6) If the entrance waveform cannot be made flat, as shown in Fig. 4-3 (a), by turning the tracking knob, go through the "entrance side adjustment" described in 4-1-2; if the exit waveform shown in Fig. 4-3 (b) cannot be made flat, go through the "exit side adjustment" in 4-1-3.


tape entrance side
tape exit side
B
D
C
A

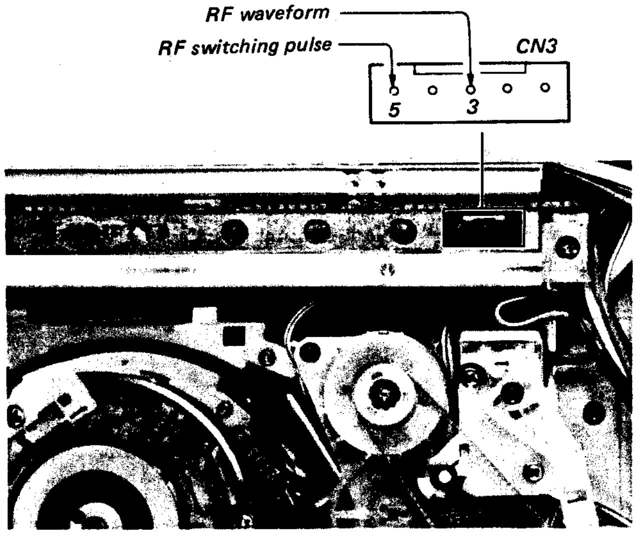
standards: at the maximum of the tracking control knob

contact: $\frac{B}{A} = 0.7$

$\frac{C}{A} = 0.7$

amount of fluctuation: $\frac{D}{A} = 0.9$

Fig. 4-2.


RF waveform
RF switching pulse
CN3
5
3

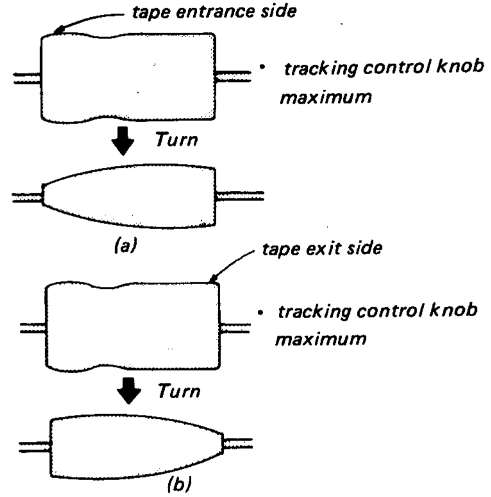

tape entrance side
• tracking control knob maximum
Turn
(a)
tape exit side
• tracking control knob maximum
Turn
(b)

Fig. 4-3.

4-1-2. Entrance Side Adjustment

Whenever the entrance side adjustment is performed, the exit side adjustment must also be performed. The various tape guides and adjustment positions are shown in Fig. 4-5.

1) Turn the No. 6 guide counterclockwise to free the movement of the tape as it enters the drum.
2) Turn the tracking control knob until the amplitude of the waveform is about 60% of its maximum.
3) Loosen No. 5 guide lock screw ❶ and turn the No. 5 guide until the entrance waveform sticks up a little above flat, as shown in the figure below. Then tighten the No. 5 guide lock screw (Fig. 4-6).
   Note:
   After tightening No.5 guide lock screw ❶, confirm that it is as in the figure below.

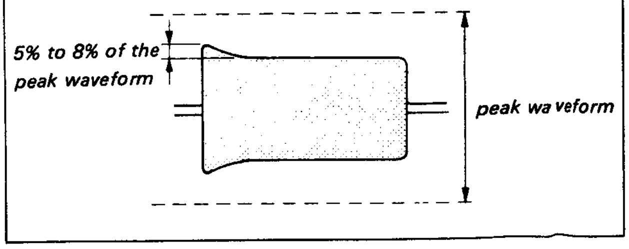

5% to 8% of the peak waveform
peak waveform

Fig. 4-4.

4) Next, lower the No. 6 guide until the waveform is flat.

5) Press the tape down between the No. 4 and No. 5 guide with a finger to lower the entrace side RF waveform, then let go and confirm that the waveform returns to what it was before.

6) In this condition, check space and curl of the No. 5 guide. If there are space and curl, adjust as explained in subsequent sections.

Note:

The tape tension between the No. 3, No. 4 and No. 5 guides must be balanced. If it is not, adjust the tilt of the No. 3 and No. 5 guides.

If the waveform cannot be made to look as shown in Fig. 4-4, or if when the tape is pressed and released on the entrance side it takes time for the waveform to return to what it was before, or if it does not return to what it was before, adjust according to the instructions given below.

[What to do when the waveform entrance output will not rise]

1) Check to see if the up-down tension between the No. 3, No. 4 and No. 5 guides is uniform. If it is not, adjust the tilt of the No. 3 and No. 5 guides.

   Note:

   The lower flange of the No. 4 guide must not protrude.

2) Raise the lower flange of the No. 4 guide to raise the entrance output.

   Note:

   It is sufficient to raise the lower flange of the No. 4 guide to 0.4 mm from its lowest position (within a rotation angle of 360°).

3) If the operation performed in step 2) fails to raise the waveform output, turn the No. 5 guide tilt adjustment screw slightly to the left, and the entrance output should rise.

[What to do when the waveform entrance output will not drop]

1) Remove the adjust plate of the No. 3 guide from the drum. Just before the lower tension of the tape becomes slack, tighten screw ❷.

2) If the tape is in contact with the lower flange of the No. 4 guide, lower the flange. If the tape is sticking up from the lower flange, adjust the tilt of the No. 5 guide so that the tape does not stick up from the lower flange of the No. 4 guide.

[What to do when there is space at the No. 5 guide]

Turn the No. 4 guide counterclockwise to run the tape upward and eliminate the space at the No. 5 guide.

Note:

At this time make sure that a large curl is not produced below the No. 4 guide.

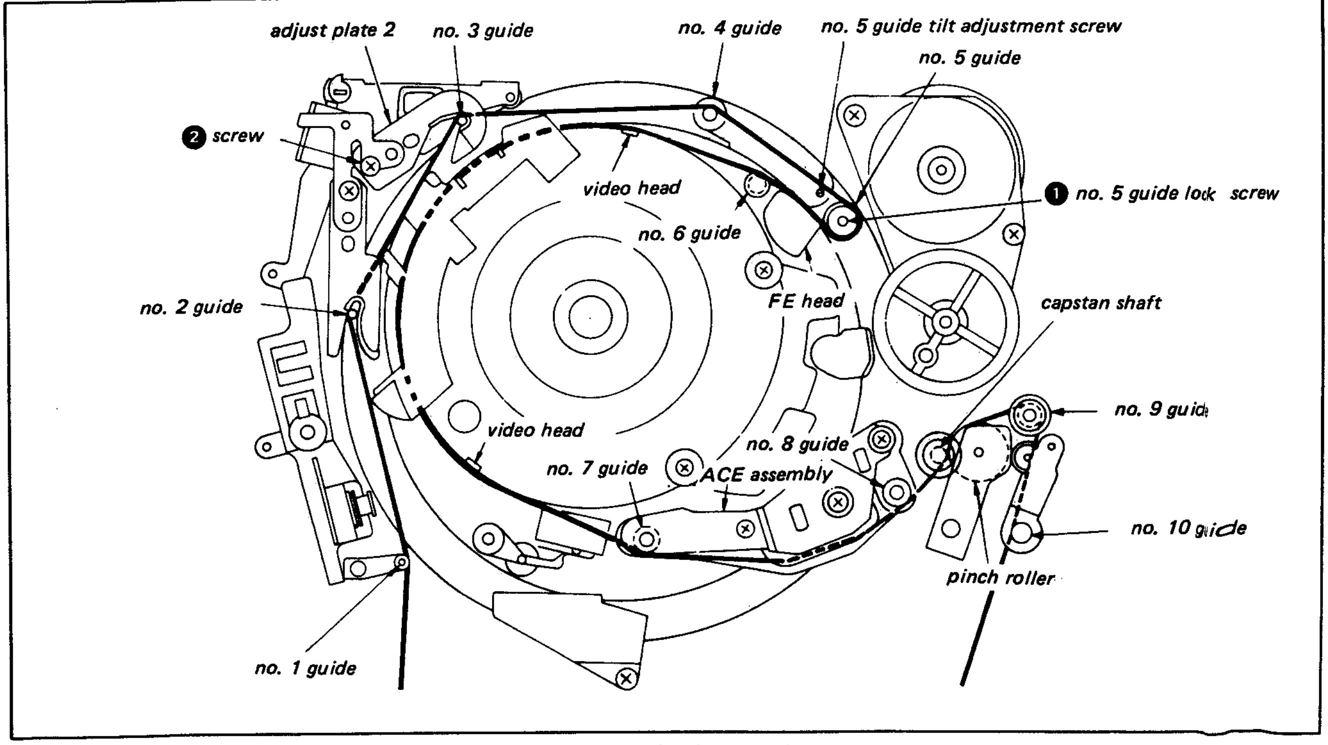
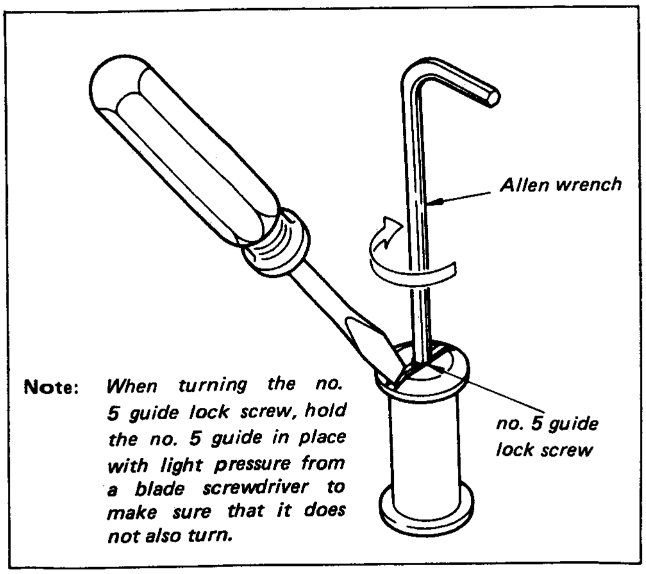

adjust plate 2
no. 3 guide
no. 4 guide
no. 5 guide tilt adjustment screw
no. 5 guide
❷ screw
video head
❶ no. 5 guide lock screw
no. 6 guide
no. 2 guide
FE head
capstan shaft
no. 9 guide
video head
no. 8 guide
no. 7 guide
ACE assembly
no. 10 guide
pinch roller
no. 1 guide

Fig. 4-5. Tape guide layout diagram

[What to do when there is curl]

1) When there is a gap below the No. 4 guide: Just before the lower tension on the tape becomes slack, move adjust plate 2 of the No. 3 guide to the outside.
2) When there is not a gap below the No. 4 guide (when there is a curl below the No. 4 guide):
   i) Check to see if the No. 4 guide has been raised up too high. If it has been raised up too high, turn the adjust plate clockwise to lower the No. 4 guide.
   ii) If the curl still has not been removed after i), tighten the No. 5 guide tilt adjustment screw in the clockwise direction until the curl is removed.



Note: *When turning the no. 5 guide lock screw, hold the no. 5 guide in place with light pressure from a blade screwdriver to make sure that it does not also turn.*

Fig. 4-6.

4-1-3. Exit Side Adjustment

1) Connect the oscilloscope to pin ⑤ on connector CN3 (on RP-8 board). Connect the external trigger to pin ③ on CN3.
2) Play the tracking section of the alignment tape. Adjust the tracking knob to reduce the amplitude of the RF output waveform to 60% of its maximum level.
3) Watch the RF output waveform when the No. 7 and No. 8 guides are raised (by turning the respective guide nuts counterclockwise) to let the tape run free. This waveform is called the exit free waveform.

   Note:
   Be careful not to raise the guides too far. They should be raised only about 0.3 to 0.5 mm, and the tape should not contact the lower flange of the ACE head.

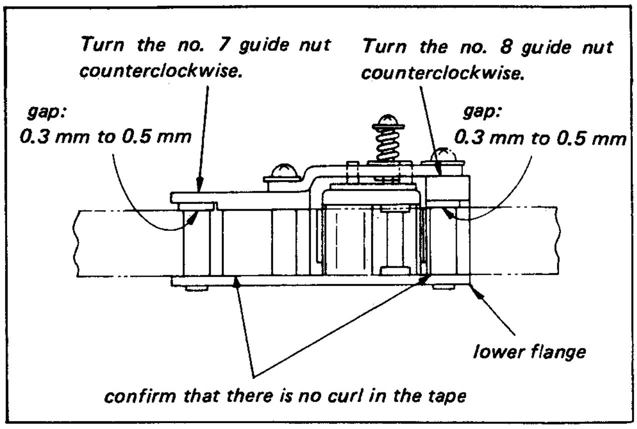

Turn the no. 7 guide nut counterclockwise.
Turn the no. 8 guide nut counterclockwise.
gap: 0.3 mm to 0.5 mm
gap: 0.3 mm to 0.5 mm
lower flange
confirm that there is no curl in the tape

Fig. 4-7.

4) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-8(a) and (b).
   - If it is outside of this range, adjust according to the procedure in 4-3.

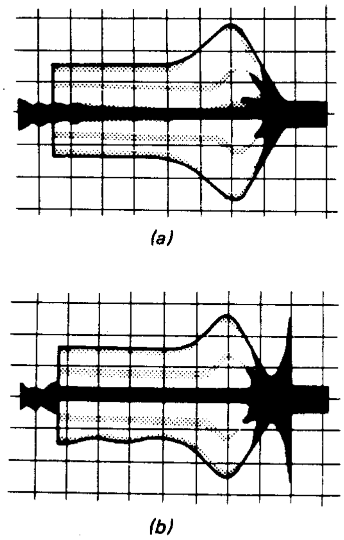


Fig. 4-8.

5) Turn the No. 7 guide nut clockwise until the waveform is flat.
6) Turn the No. 8 guide nut clockwise until the No. 8 guide is lined up with the tape (just before the waveform starts to change, lower the guide until there is no curl).
7) During playback, confirm that no curl occurs at the No. 7 guide or the No. 8 guide.
8) During rewind, confirm that no curl or space occurs at the No. 8 guide. If there is a curl or space, adjust using the No. 9 guide. After adjustment, lock the guide nut.

4-2. ADJUSTMENTS AFTER REPLACEMENT OF THE ACE ASSEMBLY

After removal or replacement of the ACE assembly, perform the adjustments listed below.

4-2-1. Exit side tracking adjustment
4-2-2. CTL head (ACE assembly) position adjustment
4-2-3. Audio head (ACE assembly) azimuth adjustment
4-2-4. Audio head (ACE assembly) height adjustment

4-2-1. Exit Side Tracking Adjustment

1) Set the parallel plate (SL-0657) up against the unit as shown in Fig. 4-9, and turn the tilt adjustment screw to adjust the audio head vertically.

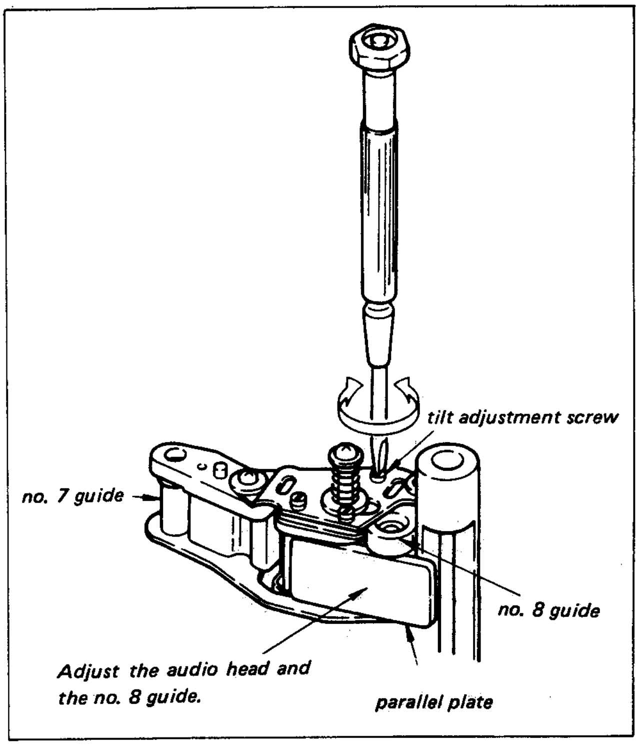

tilt adjustment screw
no. 7 guide
no. 8 guide
Adjust the audio head and the no. 8 guide.
parallel plate

Fig. 4-9.

2) Connect the oscilloscope to pin ⑤ of connector CN3 (on RP-8 board). Connect the external trigger to pin ③ of CN3.
3) Play the tracking section of the alignment tape. Adjust the tracking knob until the RF output waveform amplitude is reduced to about 60% of its maximum level.
4) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) and observe the RF exit free waveform when the tape runs free.

   Note:

   Be careful not to raise the guide too far. Raise it about 0.3 to 0.5 mm, and be careful that the tape does not contact the lower flange of the ACE head.

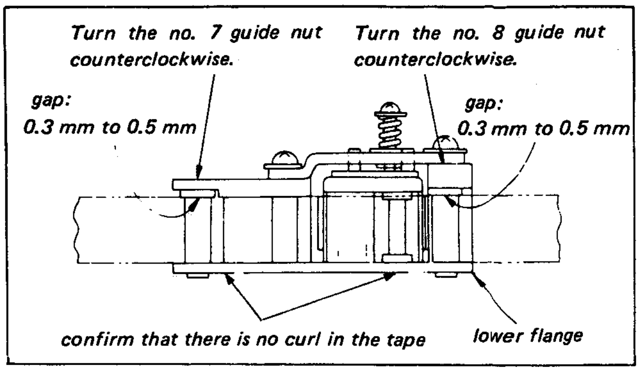

Turn the no. 7 guide nut counterclockwise.
Turn the no. 8 guide nut counterclockwise.
gap: 0.3 mm to 0.5 mm
gap: 0.3 mm to 0.5 mm
confirm that there is no curl in the tape
lower flange

Fig. 4-10.

5) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-11(a) and (b).

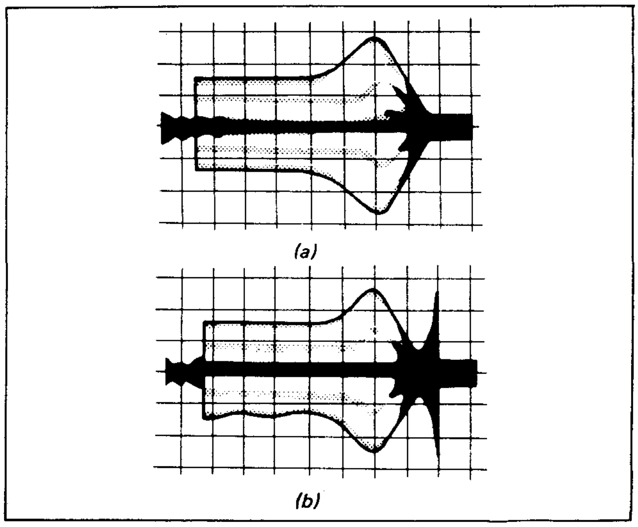


Fig. 4-11.

[When the waveform is outside this range]

- When the waveform is outside this range and has the form shown in Fig. 4-12, turn the tilt adjustment screw counterclockwise to adjust until the waveform is within the required range.

  Note:

  Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).

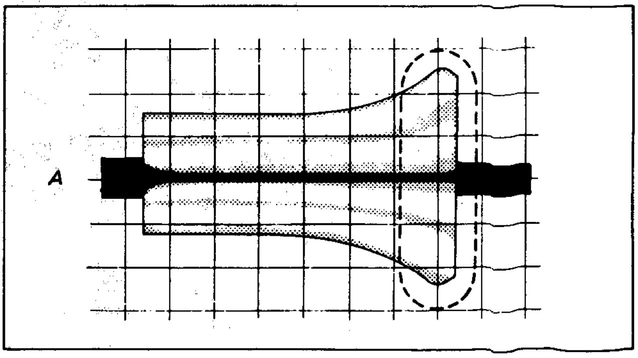


Fig. 4-12.

- When the exit free waveform is outside of the required range and has the form shown in Fig. 4-13, turn the tilt adjustment screw counterclockwise to produce waveform A (Fig. 4-12), then turn it clockwise to bring the waveform within the required range.

  Note:

  Finish the adjustment by turning the adjustment screw in the tightening direction (clockwise).

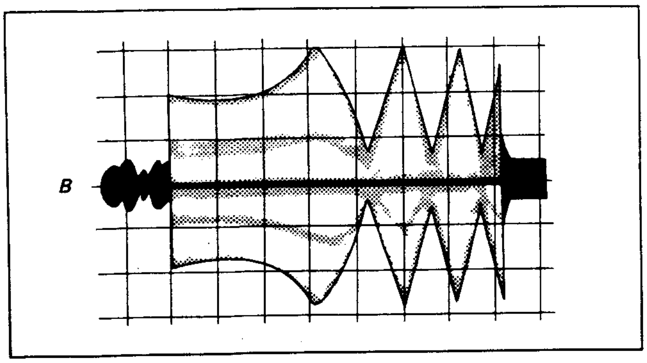
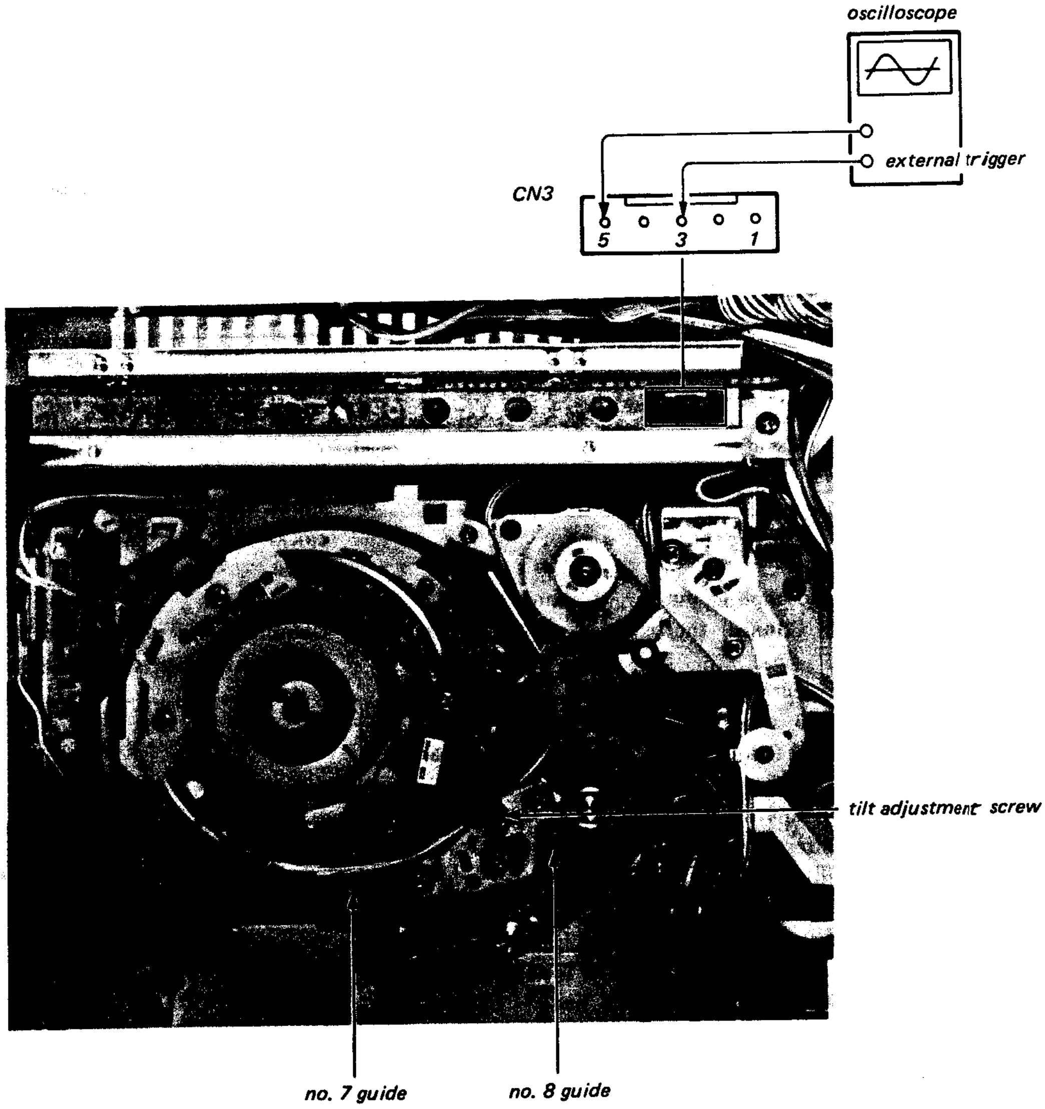


Fig. 4-13.

6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape (lower it so that there is no curl just before the waveform starts to change).
8) If the RF output waveform is as shown in Fig. 4-12 on the exit side, repeat the adjustment.

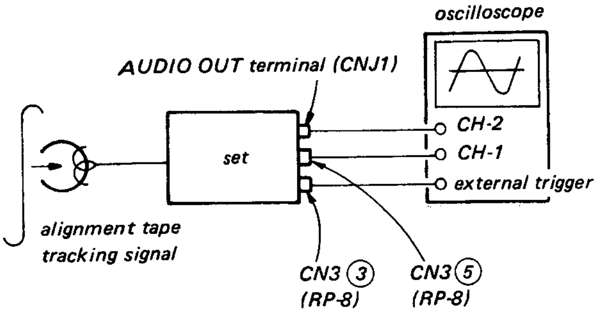
[Adjustment Location]


oscilloscope
external trigger
CN3
5
3
1
tilt adjustment screw
no. 7 guide
no. 8 guide

4-2-2. CTL Head (ACE Assembly) Position Adjustment

This adjustment includes the mechanical CTL head mounting position adjustment and the electrical tracking control center adjustment. The tracking control center adjustment is to be performed first, followed by the mechanical adjustment of the head mounting position.

Playback


oscilloscope
AUDIO OUT terminal (CNJ1)
set
CH-2
CH-1
external trigger
alignment tape
tracking signal
CN3 ③
(RP-8)
CN3 ⑤
(RP-8)

[Method of adjustment]

1) Play the tracking signal section of the alignment tape.
2) Turn the tracking control knob clockwise or counterclockwise to the center click position. Confirm that the amplitude of the RF output waveform is at its maximum level. Also confirm that the audio signal 0 level position occurs at the location of the channel B waveform. If the necessary standards are not met follow the procedure in 3).

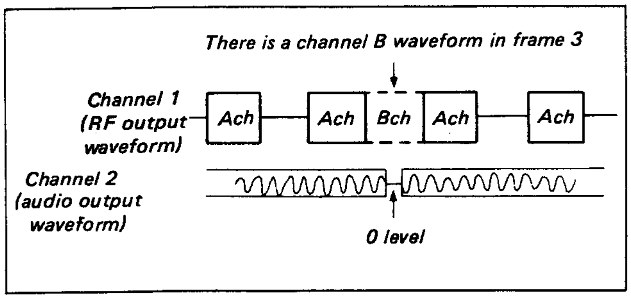

There is a channel B waveform in frame 3
Channel 1
(RF output waveform)
Ach
Ach
Bch
Ach
Ach
Channel 2
(audio output waveform)
0 level

Fig. 4-14.

3) Tracking center adjustment
   Refer to electrical adjustment 2 in section 5-3-2.
4) CTL head position adjustment
   a. Set the tracking control knob at the center click position.
   b. Loosen the 2 ACE assembly position adjustment screws, then a tool such as a blade screwdriver to slide the ACE assembly to where the RF output waveform amplitude becomes maximum.
   c. Play the color bar signal on the alignment tape and check the picture quality.
   d. Tighten the position adjustment screws, then lock them.

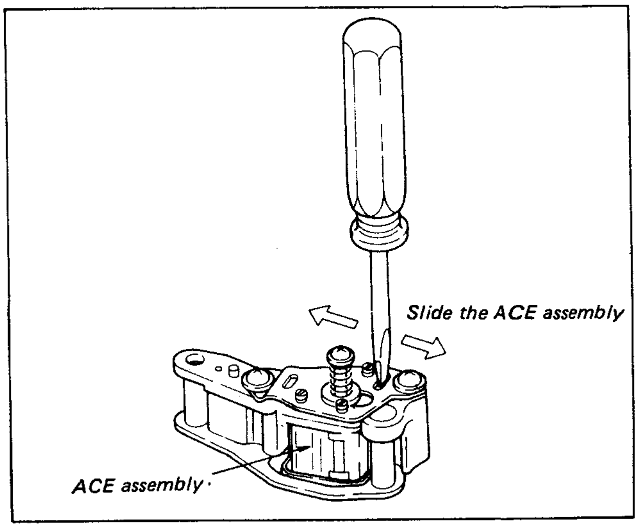
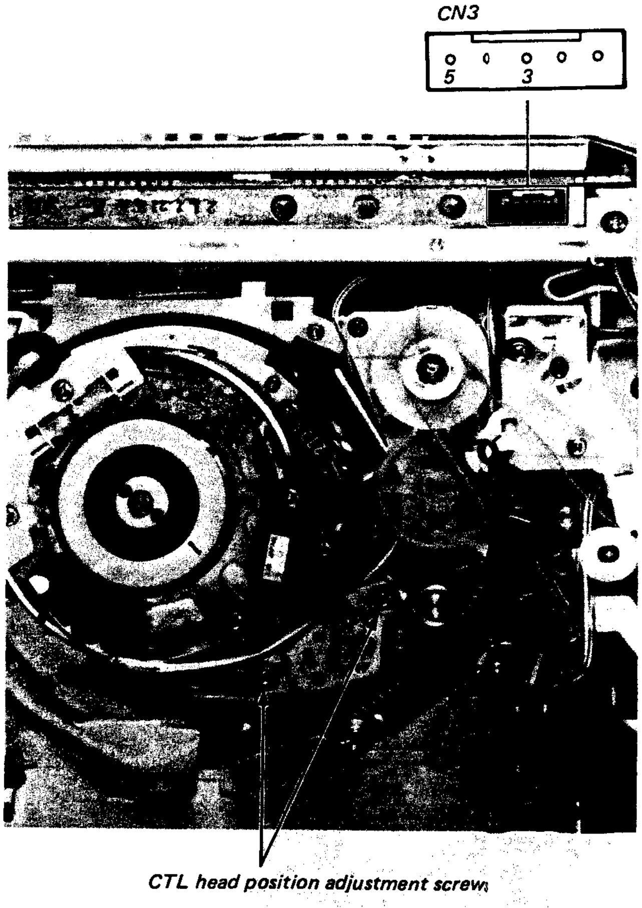

Slide the ACE assembly
ACE assembly

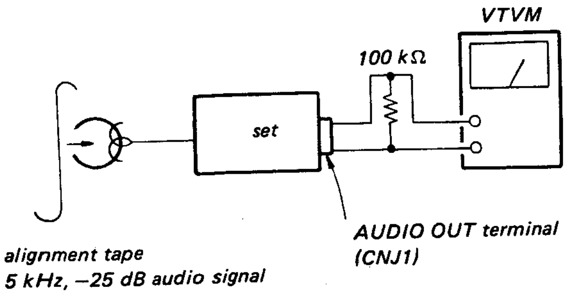
Fig. 4-15.

[Adjustment Location]


CN3
5
3
CTL head position adjustment screw

4-2-3. Audio Head (ACE Assembly) Azimuth Adjustment

Playback


VTVM
100 kΩ
set
AUDIO OUT terminal
(CNJ1)
alignment tape
5 kHz, −25 dB audio signal

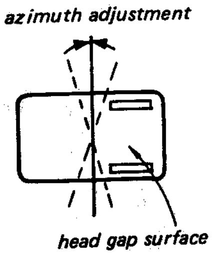
[Method of adjustment]

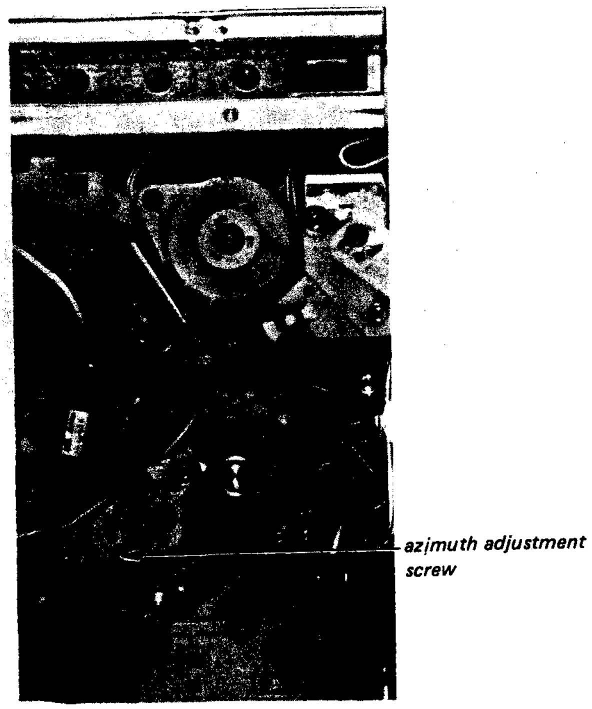
1) Play the 5 kHz, −25 dB audio signal section of the alignment tape.
2) Adjust the azimuth adjustment screw until the output level (VTVM indication) is maximum.

   Note:

   Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).
3) After adjustment, lock the adjustment screw.

[Adjustment Location]


azimuth adjustment
head gap surface

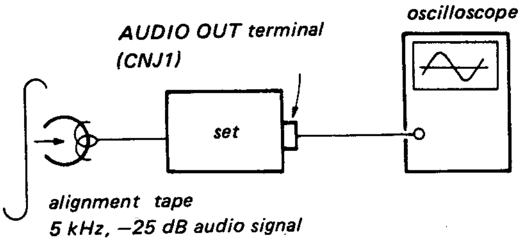

azimuth adjustment screw

4-2-4. Audio Head (ACE Assembly) Height Adjustment

[Condition]

This adjustment must only be performed after the exit side tracking adjustment has been completed.

Playback


oscilloscope
AUDIO OUT terminal
(CNJ1)
set
alignment tape
5 kHz, −25 dB audio signal

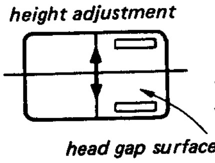
[Method of adjustment]

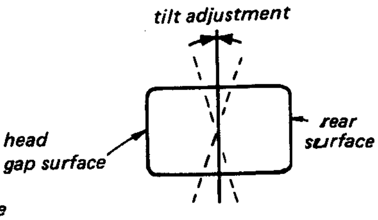
1) Play the 5 kHz, −25 dB audio signal section of the alignment tape.
2) Adjust the height adjustment screw and the tilt adjustment screw so that the amplitude of the audio line output waveform (5 kHz) becomes maximum.

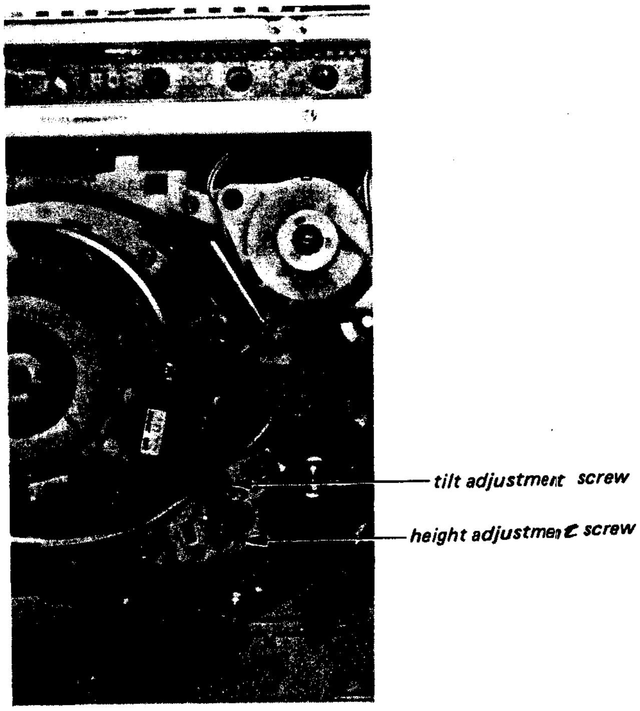
   Note:

   Both of these adjustment screws must be turned in the same direction and at the same angle, and not more than ±30°. Complete the adjustment by turning the adjustment screws in the tightening direction (clockwise).

[Adjustment Location]


height adjustment
head gap surface


tilt adjustment
head gap surface
rear surface


tilt adjustment screw
height adjustment screw

4-3. ADJUSTMENTS AFTER REPLACEMENT OF THE CAPSTAN MOTOR

When the capstan motor has been removed or replaced, perform the following adjustments.

4-3-1. Capstan shaft vertical adjustment
4-3-2. Exit side tracking adjustment

4-3-1. Capstan Shaft Vertical Adjustment

1) Set the parallel plate (SL-0657) up against the No. 10 guide vertically, as shown in Fig. 4-16.
2) Loosen the mounting screw, then turn the adjustment screw until the capstan motor shaft is vertical.
   until the capstan motor shaft is vertical.
3) After the adjustment, tighten the mounting screw.

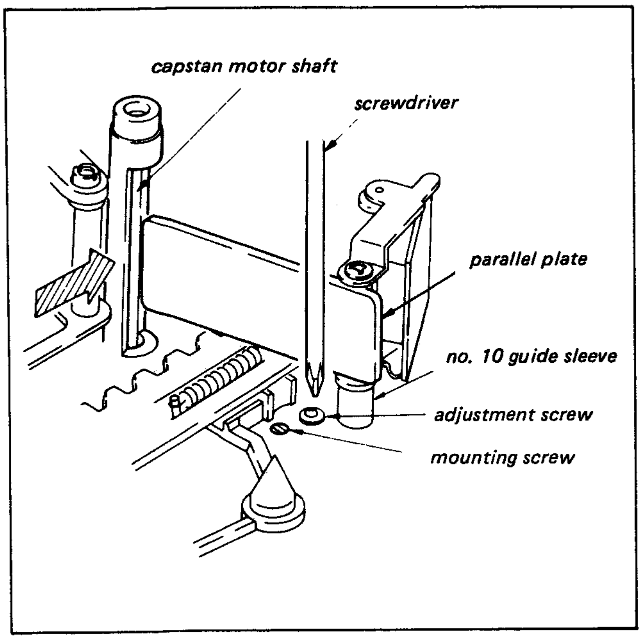

capstan motor shaft
screwdriver
parallel plate
no. 10 guide sleeve
adjustment screw
mounting screw

Fig. 4-16.

4-3-2. Exit Side Tracking Adjustment

1) Connect an oscilloscope to pin ⑤ of connector CN3 on RP-8 board. Then connect the external trigger to pin ③ of CN3.
2) Play the tracking section of the alignment tape. Adjust the tracking knob until the amplitude of the RF output waveform is reduced to about 60% of its maximum level.
3) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) to free the running of the tape, and observe the RF exit free waveform.

   Note:

   Be careful not to raise the guides too far. Raise them about 0.3 to 0.5mm. Make sure that the tape does not touch the lower flange of the ACE head.

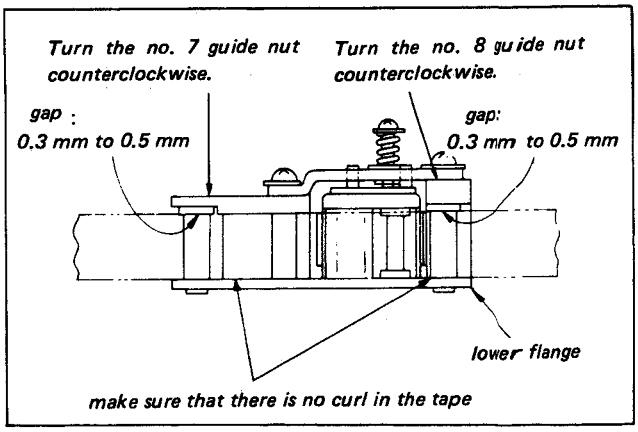

Turn the no. 7 guide nut counterclockwise.
Turn the no. 8 guide nut counterclockwise.
gap : 0.3 mm to 0.5 mm
gap: 0.3 mm to 0.5 mm
lower flange
make sure that there is no curl in the tape

Fig. 4-17.

4) At this time, confirm that the exit free waveform is within the range shown Fig. 4-18(a) and (b).

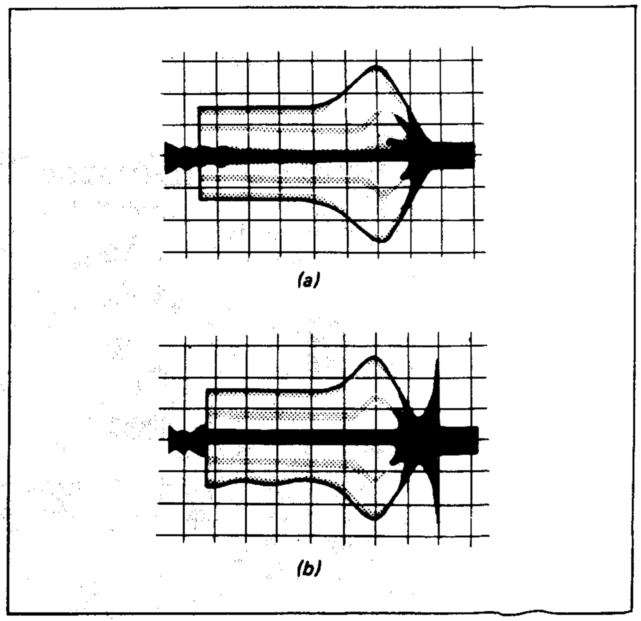


Fig. 4-18.

[When the waveform is out of range]

- When the exit free waveform is out of the correct range, and is in the form shown in Fig. 4-19, adjust as follows. Loosen the capstan mounting screw, then turn the adjustment screw counterclockwise until the waveform falls within the range shown in Fig. 4-18(a) and (b).

  Note:

  When turning the adjustment screw, wait (10 to 15 seconds) until the waveform becomes stable before adjusting further.

  Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).

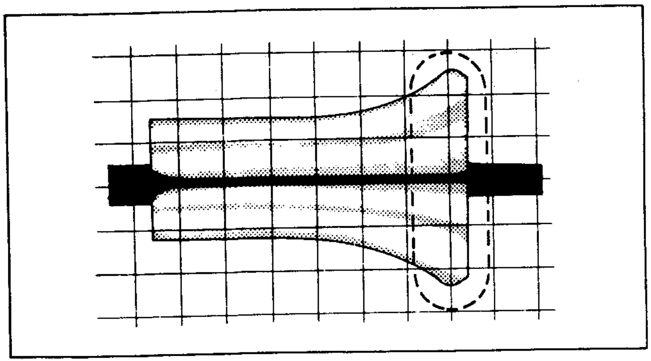


Fig. 4-19.

- If the exit waveform is outside of its correct range and has the form shown in Fig. 4-20, adjust as follows. Loosen the capstan mounting screw, then turn the adjustment screw clockwise until the waveform is brought within the range shown in Fig. 4-18(a) and (b).

Note:

When turning the adjustment screw, wait (10 to 15 seconds) until the waveform becomes stable before adjusting further. Complete the adjustment by turning the adjustment screw in the tightening direction (clockwise).

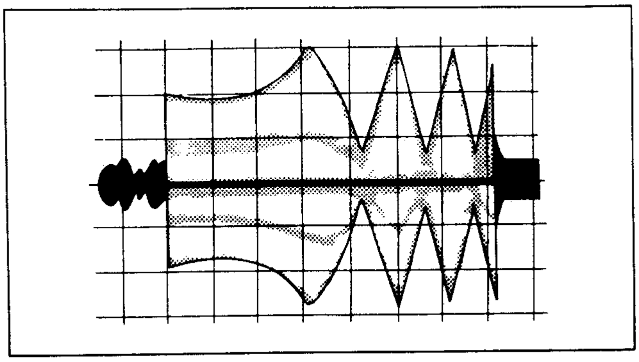
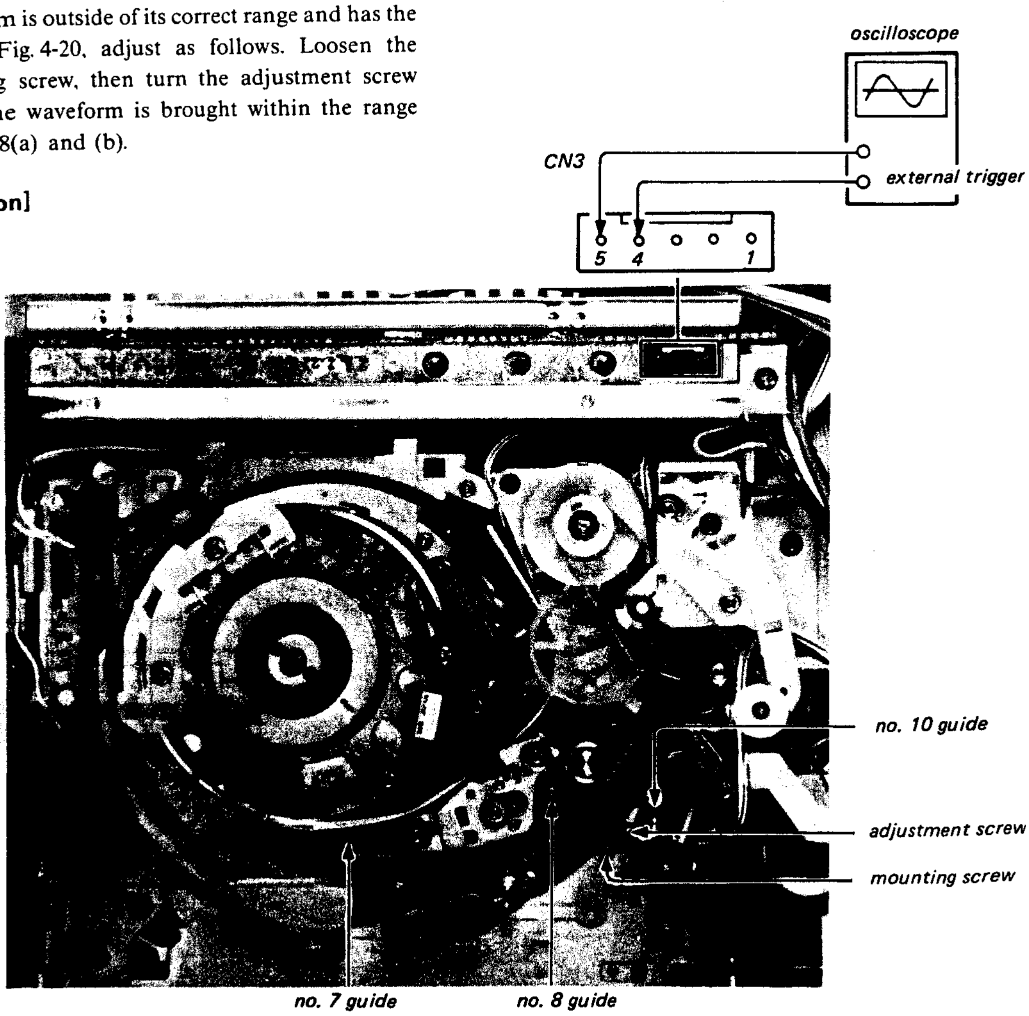


Fig. 4-20.

5) Tighten the mounting screw.
6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape. (Lower it until there is no curl just before the waveform changes.)
8) If the exit waveform rises, use the No. 7 guide to flatten it and then line the No. 8 guide up again.

[Adjustment Location]



4-4. HOW TO INSPECT THE TAPE TRAVELING WHEN ADJUSTING THE TAPE PATH

Adjust and check the tape path using the alignment tape following the adjustment manual, then check the tape travel using the procedure below.

1) Prepare one L-830 reel. Remove the cassette cover referring to Fig. 4-1 of the adjustment manual.
   Fig. 4-1 of the adjustment guide.
2) Run the L-830 tape in playback mode and check the following points.
   i) Entrance side
      Confirm that the tape does not contact the upper flange of the No. 4 guide or the No. 6 guide, and is not damaged. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-21)
   ii) Exit side
      Confirm that the tape does not contact the upper flange of the No. 7 guide or the No. 8 guide, or the upper or lower flange of the No. 10 guide, and is not scratched. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-22)
   iii) If the tape was found to not be running correctly in step ii), readjust the tape path using the alignment tape, following the adjustment manual.
      If the tape is not running correctly on the entrance side, refer to section 4-1-2 of the adjustment manual. If the tape is not running correctly on the exit side, refer to section 4-1-3 of the adjustment manual.

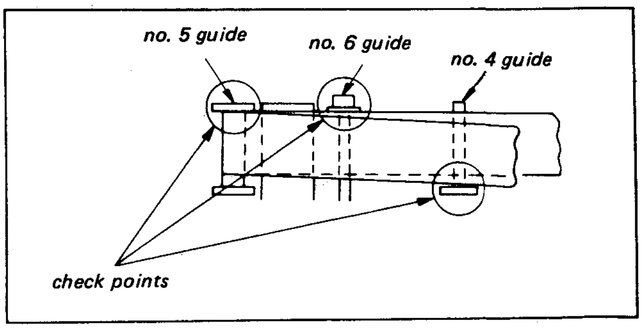


Fig. 4-21.

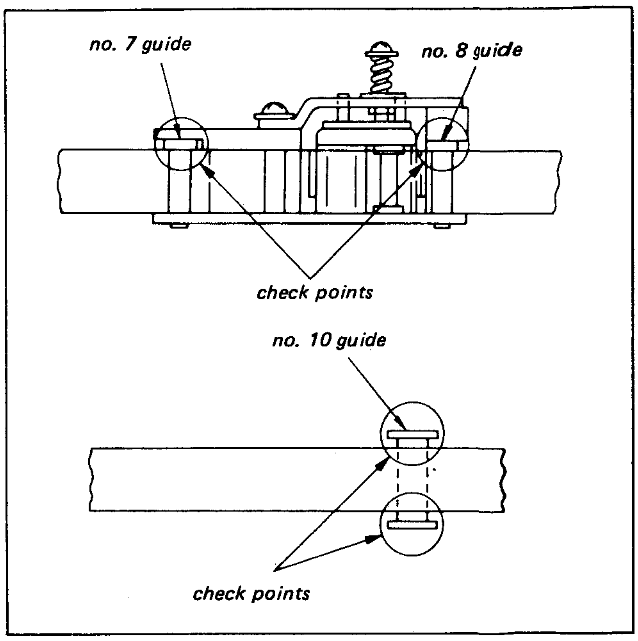


Fig. 4-22.

SECTION 5
ELECTRICAL ADJUSTMENTS

All of the instructions needed to adjust the electrical circuits in this set are given in this section.

[Instruments and tools needed]

(1) Color TV
(2) Single or double-trace oscilloscope, 15 MHz band or above, with delay mode
(3) Frequency counter (4 digits or more)
(4) NTSC pattern generator
(5) Digital voltmeter
(6) Multitester (20 kΩ/V)
(7) Audio generator
(8) Attenuator
(9) Distortion meter
(10) Alignment tape (KR5-1M) Part No.: (8-969-995-82)
(11) Adjustment screwdriver (for use in adjusting semi-fixed resistors and coils) Part No.: 7-700-733-01

[Setup for adjustments]

For these adjustments connect the NTSC pattern generator to the SL-2410/2415 VHF antenna terminal, and use the output of the pattern generator as the RF input signal. This RF signal is processed by the internal tuner in the VTR and the IF circuit. The video output signal from the IF circuit must satisfy the specifications shown in the diagram below. Connec the oscilloscope to TP2 on YC-27 board to check the video output signal.
The items to be checked are the following:

(1) The amplitude of the horizontal sync signal must be about 0.3Vp-p.
(2) The amplitude of the video signal must be about 0.7 Vp-p.
(3) The amplitude of the burst signal must be about 0.3 Vp-p. The video (color bar) signal used in the adjustments is shown in Fig. 5-1.

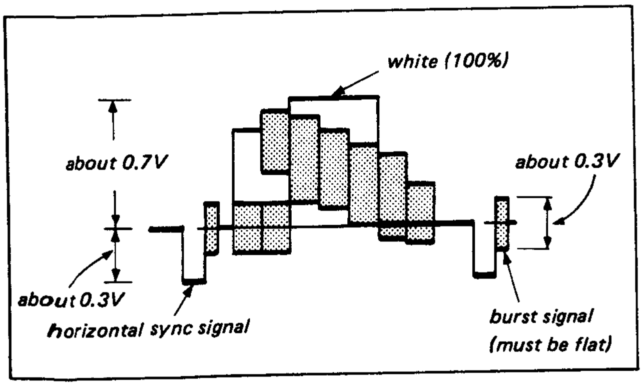

white (100%)
about 0.7V
about 0.3V
about 0.3V
horizontal sync signal
burst signal
(must be flat)

Fig. 5-1. Pattern generator color bar signal

contents of the KR5-1M alignment tape

	mode	video signal	audio signal	time
1	βII	Color Bar	3kHz −5dB	4 minutes each
2		Monoscope	333Hz −25dB	
3		RF sweep	5kHz −25dB	
4		Tracking	1kHz −5dB	
5	βIII	Color Bar	3kHz −5dB	
6		Monoscope	5kHz −25dB	

[On the color bar signal]

The 75% color bar signal recorded on the alignment tape is shown in Fig. 5-3.

Note:

Measured at TP2 on YC-27 board. (75Ω terminated)

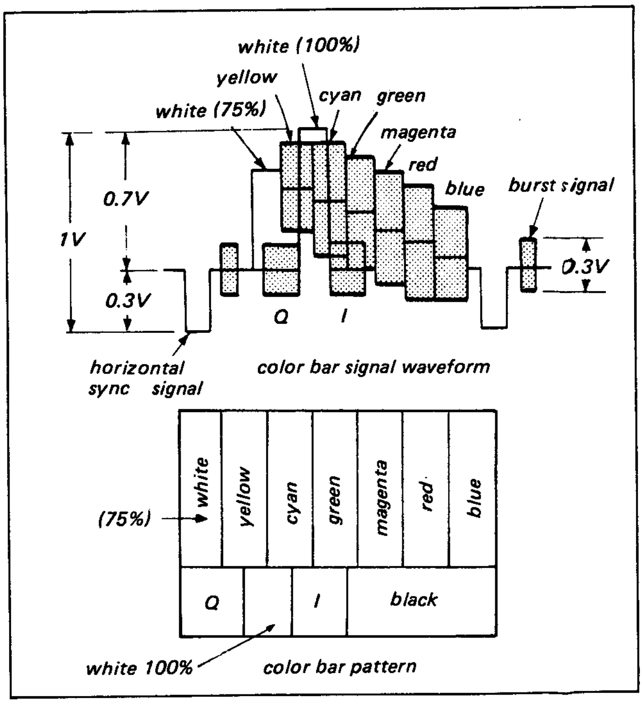

white (100%)
yellow
white (75%)
cyan
green
magenta
red
blue
burst signal
0.7V
1V
0.3V
0.3V
Q
I
horizontal sync signal
color bar signal waveform
(75%)
white
yellow
cyan
green
magenta
red
blue
Q
I
black
white 100%
color bar pattern

Fig. 5-2. Color bar signal an the alignment tape

[Method of terminating in 75Ω]

To terminate the video output terminal (YC-27 board, TP2), do as shown in Fig. 5-3.

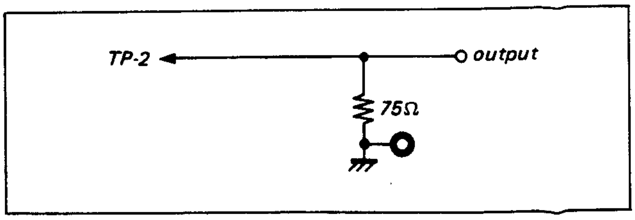

TP-2
output
75Ω

Fig. 5-3. 75Ω termination

VR Adjustment Jig Screwdriver

Please use a special jig screwdriver for printed circuit board variable VR and inductance adjustment. A regular screwdriver is too large and difficult to use when adjusting the VRs from the printed pattern side, so the jig screwdriver shown in Fig. 5-4 has been prepared. The metal end of the screwdriver is for VR and trimmer capacitor adjustment.

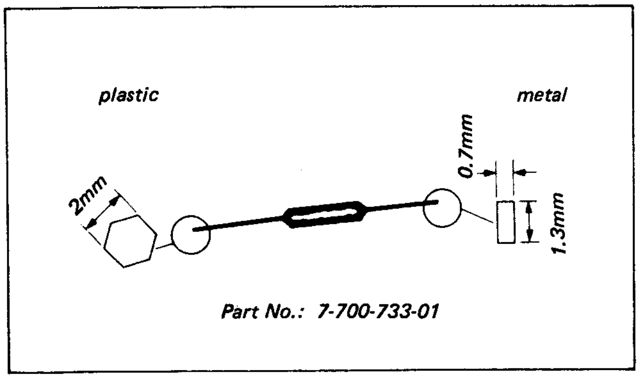


Fig. 5-4. Adjustment Jig screwdriver

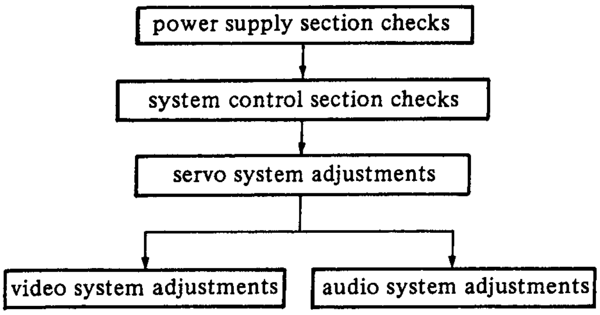
[Standard input/output levels and impedances]

Input and output terminals

Video input:	pin jack input signal: 1Vp-p ±0.5Vp-p, 75Ω unbalanced, negative sync
Video output:	pin jack output signal: 1Vp-p ±0.5Vp-p, 75Ω unbalanced, negative sync
Audio input:	pin jack input level: −10 dBs (0 dBs = 0.775 Vrms) input impedance: 47 kΩ or higher
Audio output:	pin jack output: −10dBs (0.25Vrms) at 100 kΩ negative load load impedance: 10 kΩ or higher
Microphone input:	mini jack −60 dBs. for low impedance use

[Adjustment procedure]

Adjust according to the procedure described below.



5-1. POWER SUPPLY SECTION CHECKS

Perform these measurements in E-E mode.

1. Unregulated Switch 16V Check (PS-27 Board)

The voltage between pin ① of CN2 and pin ⑤ on the ground side should be 19V ± 3V.

2. Unregulated Switch 45V Check (PS-27 Board)

The voltage between pin ① of CN4 and pin ④ on the ground side should be 50V ± 5V.

3. Unregulated Switch −12V Check (PS-27 Board)

The voltage between pin ② of CN4 and pin ④ on the ground side should be −12.0V ± 1.5V.

4. Switched (REG) 12V (PS-27 Board)

The voltage between pin ② of CN2 and pin ⑤ on the ground side should be 12V ± 0.15V.

5. Switched (System) 12V (PS-27 Board)

The voltage between pin ⑥ of CN2 and pin ⑨ on the ground side should be 12V ± 0.15V.

5-2. SYSTEM CONTROL SECTION CHECKS (SS-13 board)

Perform these measurements in E-E mode.

1. Clock Oscillator Frequency Check

Measure at the external clock input pin of the system control IC (pin ㊷ of ICs 401 and 402) on SS-13 board.

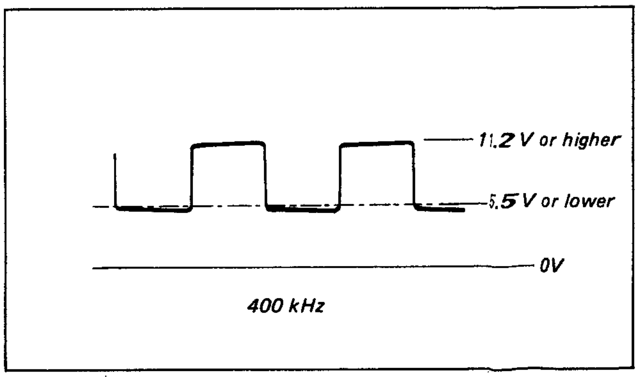


Fig. 5-5. Clock oscillation frequency check

5-3. SERVO SYSTEM ADJUSTMENTS

[Adjustment procedure]

5-3-1. Drum Servo System

1. Voltage checks
2. Clock check
3. Drum free speed adjustment
4. RF switching position adjustment
5. Drum f_H correction adjustment

5-3-2. Capstan Servo System

1. Capstan free speed adjustment
2. Tracking center adjustment

5-3-1. Drum Servo System Adjustments (SS-13 board)

1. Voltage checks

IC1 pin ㉚........ 5.7V ± 0.3V

IC1 pin ⑦........ 8.95V ± 0.3V

IC1 pin ⑩........ 3.4V ± 0.3V

2. Clock check

Measure the waveform at pin ㉘ of the servo IC (IC1).

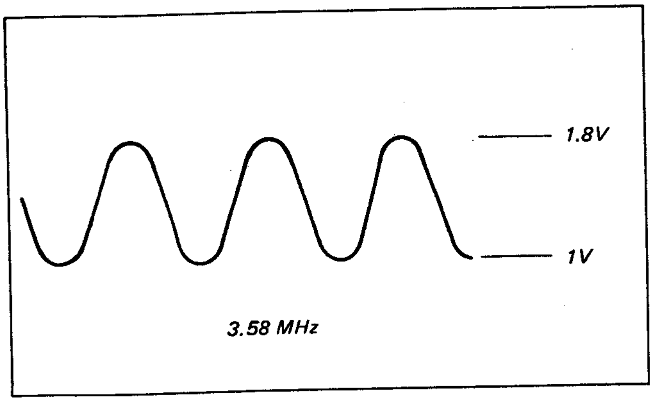
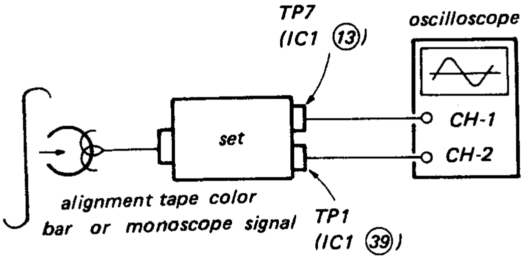


Fig. 5-6. Clock check

3. Drum free speed adjustment (SS-13 board)

Mode: Playback


TP7
(IC1 ⑬)
oscilloscope
set
CH-1
CH-2
alignment tape color bar or monoscope signal
TP1
(IC1 ㊴)

[Method of adjustment]

1) Play the color bar signal or the monoscope signal on the alignment tape.
2) Adjust to 350 μsec ± 10 μsec using RV4. (See Fig. 5-7.)

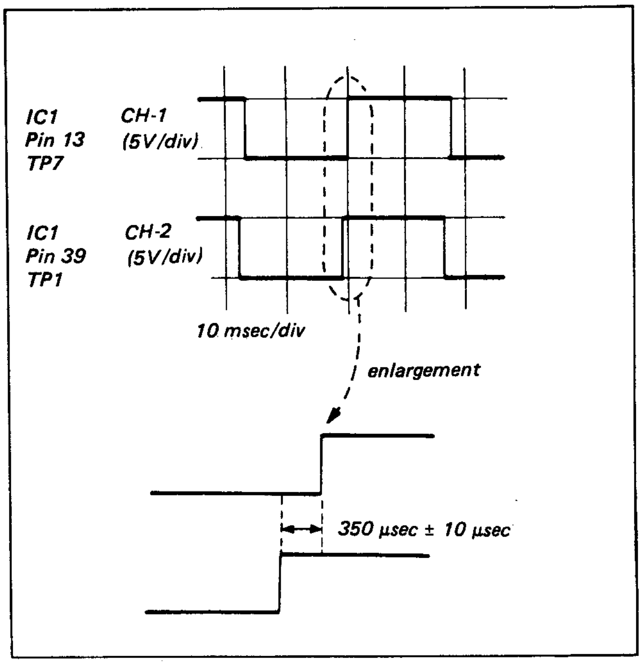
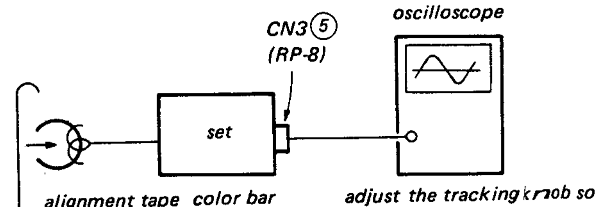


Fig. 5-7. Drum free speed adjustment

4-1. RF switching position adjustment 1 (RP-8 board)

Mode: Playback


CN3⑤
(RP-8)
oscilloscope
set
alignment tape color bar signal or monoscope signal

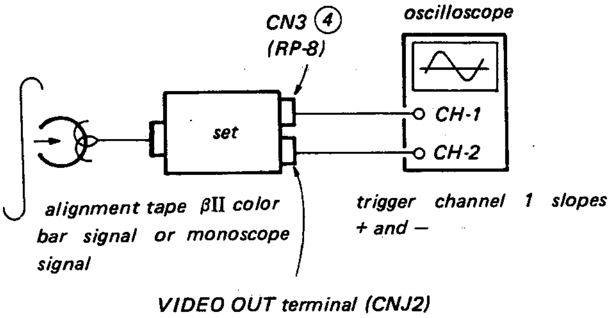
adjust the tracking knob so that the amplitude of the radio frequency waveform becomes maximum.

[Method of adjustment]

1) Play the color bar signal or the monoscope signal on the alignment tape and adjust the tracking knob so that the amplitude of the RF waveform pin ⑤ of CN3 becomes maximum.

4-2. RF switching position adjustment 2 (RP-8, SS-13 boards)

Mode: Playback


CN3 ④
(RP-8)
oscilloscope
set
CH-1
CH-2
alignment tape βII color bar signal or monoscope signal
trigger channel 1 slopes + and −
VIDEO OUT terminal (CNJ2)

[Method of adjustment]

1) Set the trigger slope of the oscilloscope to +.
2) Adjust RV6 (PG.A) (on SS-13 board) so that the time from the falling edge of the channel 1 waveform to the vertical sync signal on channel 2 becomes 7H ± 1H lines.

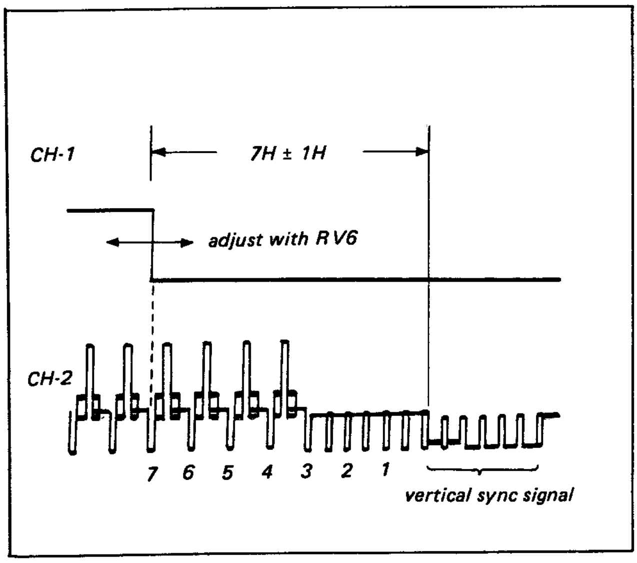

CH-1
7H ± 1H
adjust with RV6
CH-2
7 6 5 4 3 2 1
vertical sync signal

Fig. 5-8. RF switching position adjustment

3) Set the oscilloscope trigger slope to −.
4) Adjust RV5 (PG.B) (on SS-13 board) so that the time between the rising edge of the channel 1 waveform and the vertical sync signal on channel 2 becomes 7H ± 1H lines.

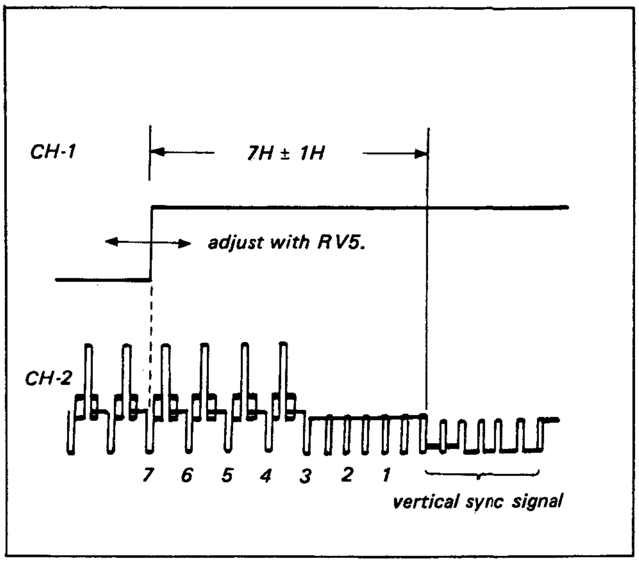
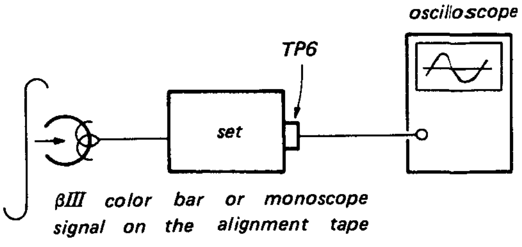

CH-1
7H ± 1H
adjust with RV5.
CH-2
7 6 5 4 3 2 1
vertical sync signal

Fig. 5-9. RF switching position adjustment

5. Drum f$_H$ correction adjustment (SS-13 board)

Mode: Picture search


oscilloscope
TP6
set
βIII color bar or monoscope signal on the alignment tape

[Method of adjustment]

1) Run the set in picture search mode over the βIII color bar signal or the monoscope signal section of the alignment tape.
2) While running the picture search (◀◀: REVIEW), adjust RV9 so that the interval shown in the diagram below becomes 63.62 μsec ± 0.1 μsec.

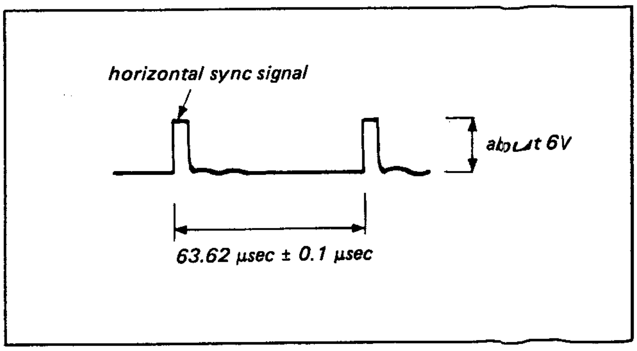
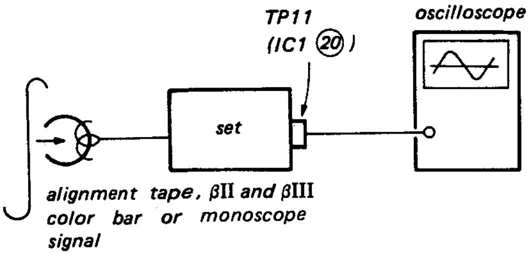

horizontal sync signal
about 6V
63.62 μsec ± 0.1 μsec

Fig. 5-10. Drum f$_H$ correction adjustment

5-3-2. Capstan Servo System Adjustment (SS-13 board)

1. Capstan free speed adjustment

Mode: Playback


TP11
(IC1 ⑳)
oscilloscope
set
alignment tape, βII and βIII color bar or monoscope signal

[Method of adjustment]

- βII mode

1) Play the βII color bar signal or the monoscope signal on the alignment tape.
2) Adjust RV3 so that the duty ratio of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at pin ⑰ of IC1.

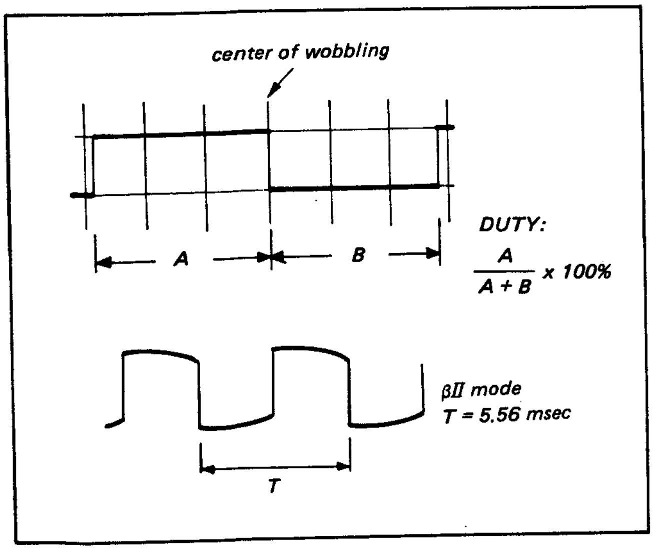

center of wobbling
A
B
DUTY:
$\frac{A}{A+B} \times 100\%$
βII mode
T = 5.56 msec
T

Fig. 5-11. βII capstan free speed adjustment

- βIII mode

3) Play the βIII color bar signal or monoscope signal on the alignment tape.
4) Adjust RV2 so that the duty ratio of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at pin ⑰ of IC1.

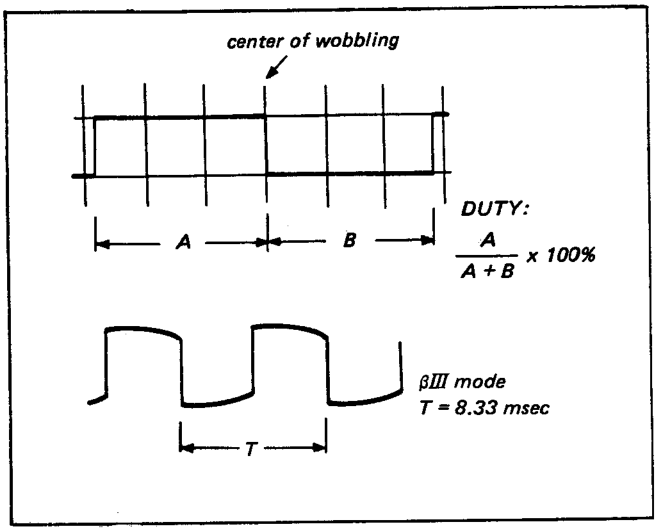

center of wobbling
A
B
DUTY:
$\frac{A}{A+B} \times 100\%$
βIII mode
T = 8.33 msec
T

Fig. 5-12-1. βIII capstan free speed adjustment

- βI mode

5) Load a blank tape and set the unit to the REC mode. Make a connection between pin ㉑ (12V) and pin ㉚ (βI MODE OUT), of IC402, and set the unit to the βI REC mode.
6) Adjust RV1 so that the duty ratio of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at pin ⑰ of IC1.

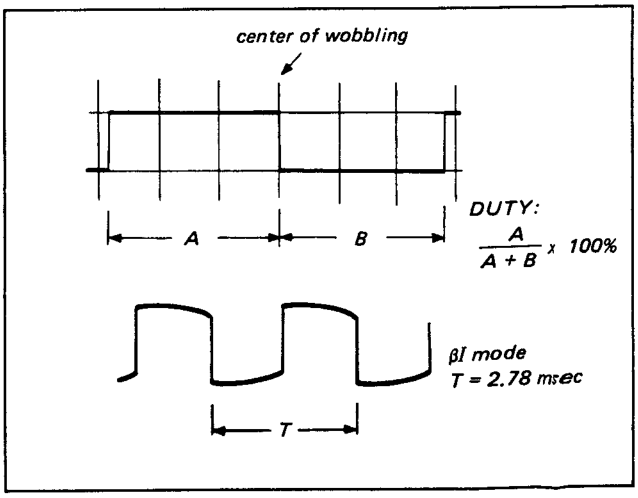
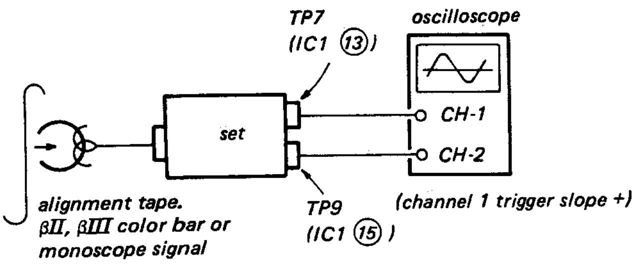

center of wobbling
A
B
DUTY:
$\frac{A}{A+B} \times 100\%$
βI mode
T = 2.78 msec
T

Fig. 5-12-2. βI capstan free speed adjustment

2. Tracking center adjustment (SS-13 board)

Mode: Playback



[Method of adjustment]

1) The tracking knob must be set to the center click position.
2) Adjust RV8 until the interval shown in the diagram below becomes 860 µsec ± 50 µsec. (See Fig. 5-13.)

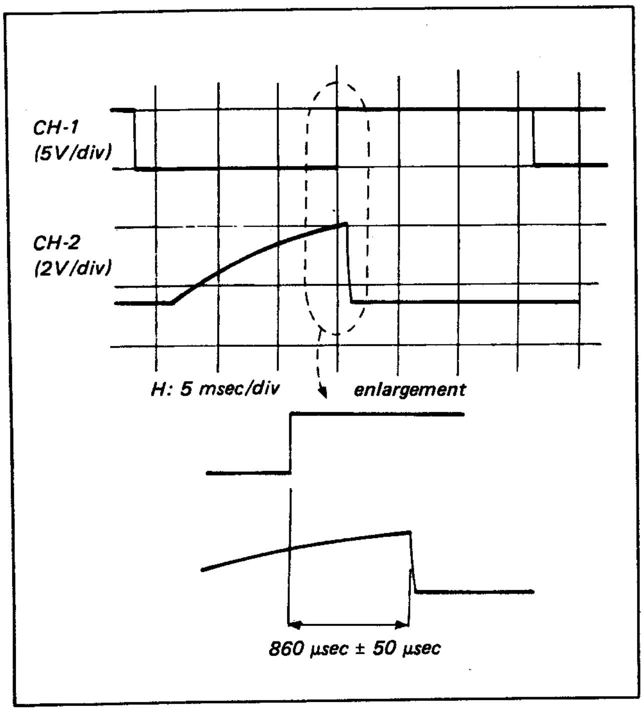


Fig. 5-13. Tracking center adjustment

5-4. VIDEO SYSTEM ADJUSTMENTS

As a rule the playback system is adjusted using the alignment tape. When it has been confirmed that the playback system is normal, the recording system is adjusted.

The order in which the adjustments are performed is given below. Both Y signal system adjustments and chroma signal system adjustments are necessary for both the playback system and the recording system.

The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Confirm that the sync signal and the color burst signal meet the standards specified under "setup at the time of adjustment".

Playback system

1. Playback frequency response adjustment
2. Dropout compensation sensitivity adjustment
3. Playback emphasis adjustment
4. Noise canceler II adjustment
5. 3.58 MHz oscillation frequency adjustment
6. VCO free frequency adjustment (AFC circuit)
7. Skew oscillation adjustment (0.5_H correction circuit)
8. AGC adjustment (0.5_H correction circuit)
9. Delay level adjustment (0.5_H correction circuit)
10. Delay phase adjustment (0.5_H correction circuit)
11. Delay color signal level adjustment (0.5_H correction circuit)

Recording system

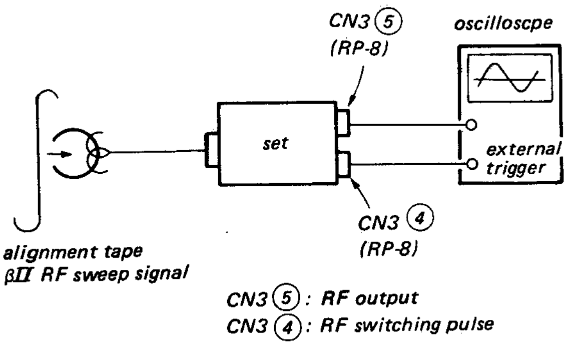
12. Peak AGC and sync AGC adjustments
13. Comb filter adjustment
14. Sync tip carrier frequency setting and FM deviation adjustment
15. 1/2 f_H shift adjustment
16. 4.27 MHz balance adjustment
17. ACC adjustment (automatic color amplitude)
18. White clip adjustment
19. Black clip adjustment
20. Luminance FM recording current adjustment
21. Color recording current adjustment

5-4-1. Playback system

1. Playback Frequency Response Adjustment (RP-8 board)

- Adjust both A CH and B CH.
- B CH is indicated by ( ).

Mode: Playback


CN3⑤
(RP-8)
oscilloscpe
set
external trigger
CN3④
(RP-8)
alignment tape
βII RF sweep signal
CN3⑤: RF output
CN3④: RF switching pulse

[Method of adjustment]

(1) Adjust the tracking knob until the output level becomes maximum.
(2) Set the oscilloscope trigger slope to – (+).
(3) Adjust RV3 (RV1) until the RF waveform is flat in the range of 2 MHz to 4.5 MHz, and so that it drops slightly at 5.1 MHz. (See Fig. 5-14)
(4) Adjust with RV2 so that B CH level is the same as A CH.

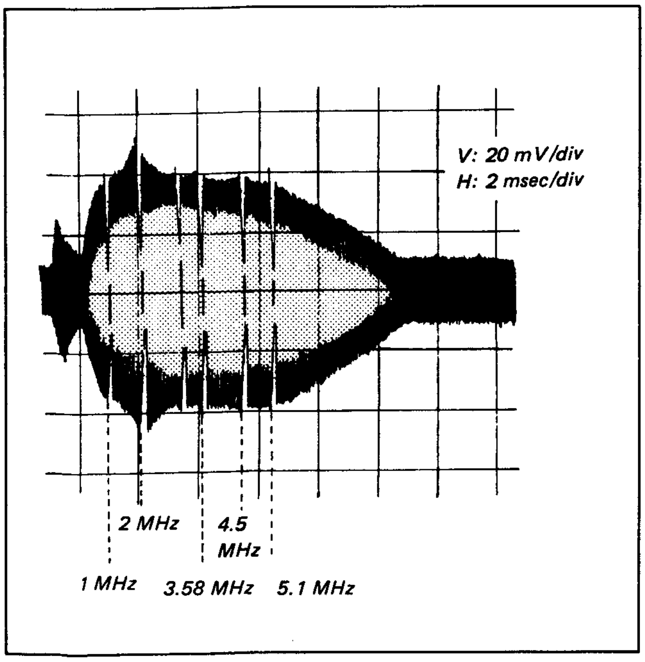
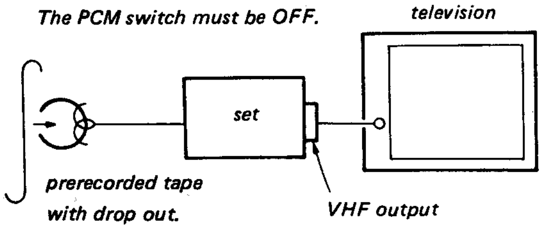


Fig. 5-14. Playback frequency response adjustment

2. Dropout Compensation Sensitivity Adjustment (RP-8 board)

Mode: Playback

The PCM switch must be OFF.

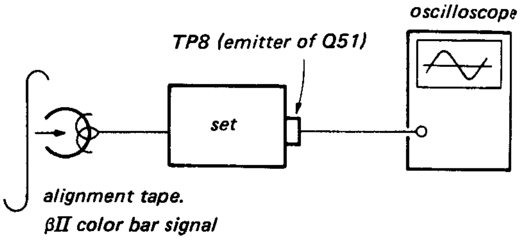

television
set
prerecorded tape
with drop out.
VHF output

[Method of adjustment]

1) Turn RV5 fully counterclockwise as seen from the pattern side. (↺)
Dropout will appear on the monitor TV.
2) Turn RV5 clockwise slowly (↻) and set it at the point at which the dropouts can no longer be seen.
3) Rewind the tape and play it again. Confirm that the dropouts are being compensated for on the section on which many dropouts were seen in step 1).

3. Playback Emphasis Adjustment

Mode: Playback


oscilloscope
TP8 (emitter of Q51)
set
alignment tape.
βII color bar signal

[Method of adjustment]

1) Play the color bar signal on the alignment tape.
2) Adjust the tracking knob to the position at which the tracking is best.
3) Adjust RV9 until the amplitude shown in the diagram below is 1.15 Vp-p.

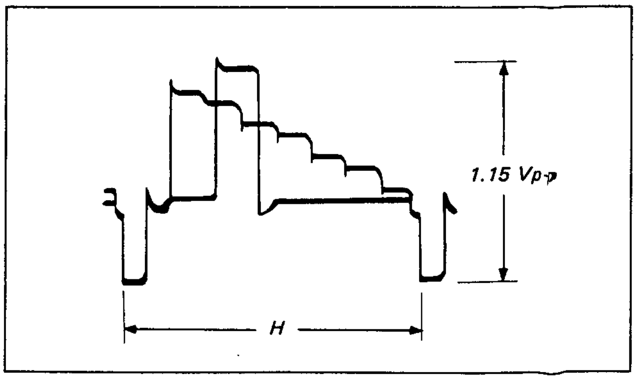


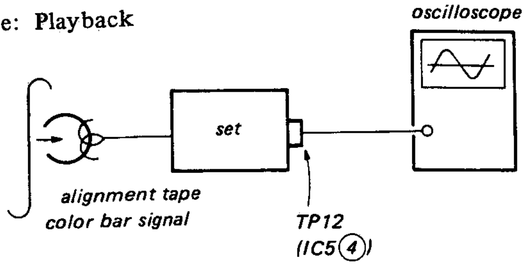
Fig. 5-15. Playback emphasis adjustment

4. Noise Canceler II Adjustment

Note:

After this adjustment is completed, do the "playback emphasis adjustment" in section 3, then repeat the noise canceler II adjustment.

Mode: Playback


oscilloscope
set
alignment tape
color bar signal
TP12
(IC5④)

[Method of adjustment]

1) Play the color bar signal on the alignment tape.
2) Adjust RV19 until the output becomes minimum. (See Fig. 5-16.)

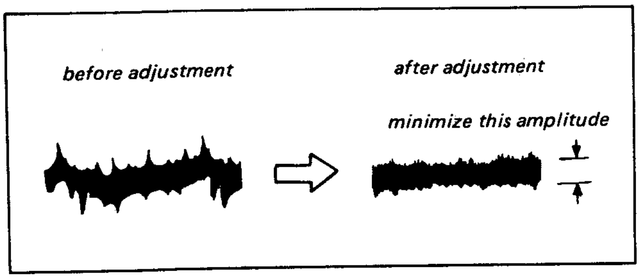
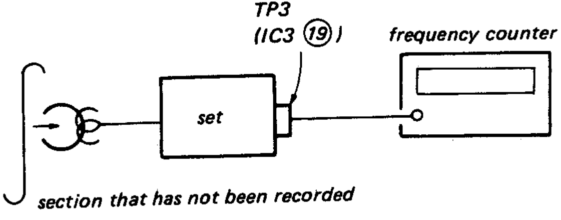

before adjustment
after adjustment
minimize this amplitude

Fig. 5-16. Noise canceler II adjustment

5. 3.58MHz Oscillation Frequency Adjustment (YC-27 board)

Mode: playback


TP3
(IC3 ⑲)
frequency counter
set
section that has not been recorded

[Method of adjustment]

1) Play a tape on which nothing has been recorded (or alternatively ground the junction of C45 and C46 to cut the color signal out).
2) Adjust T4 until the frequency becomes 3579545 Hz ± 5 Hz.

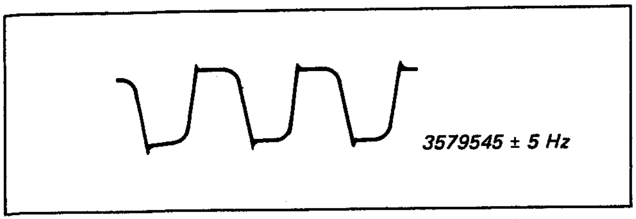
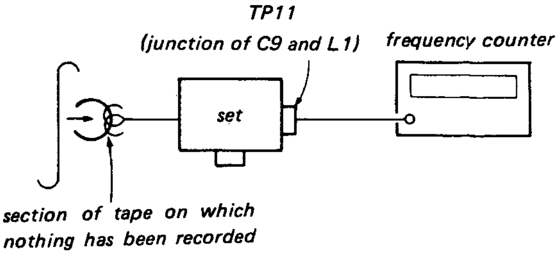

3579545 ± 5 Hz

Fig. 5-17. 3.58MHz oscillation frequency adjustment

6. VCO Free Frequency Adjustment (AFC Circuit) (YC-27 board)

Mode: Playback

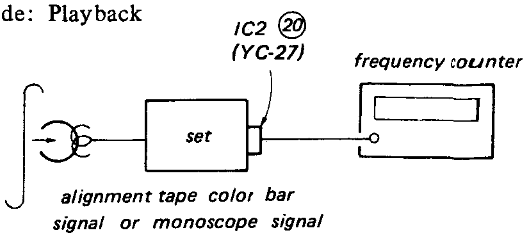

TP11
(junction of C9 and L1)
frequency counter
set
section of tape on which
nothing has been recorded

[Method of adjustment]

1) Play a tape on which nothing has been recorded (or alternatively ground the junction of C45 and C46 to cut the reproduced color signal out).
2) Adjust RV1 until the frequency becomes 688.374 kHz ± 1.3 kHz.

7. Skew Oscillation Adjustment (0.5H Correction Circuit) (YC-27 board)

Mode: Playback


IC2 ⑳
(YC-27)
frequency counter
set
alignment tape color bar
signal or monoscope signal

[Method adjustment]

1) Connect a lead wire between the emitter of Q9 (the 9V power supply line) and pin ㉑ of IC2.
2) Play the color bar signal or the monoscope signal on the alignment tape.
3) Adjust RV3 until the reading on the frequency counter becomes 16.3 kHz ± 100 Hz.

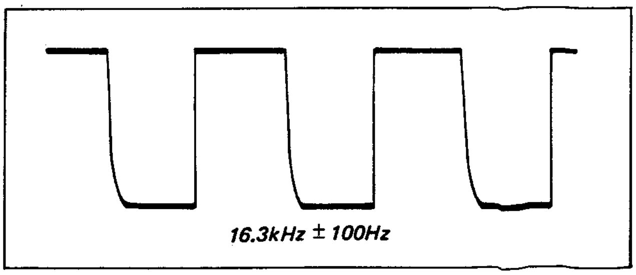
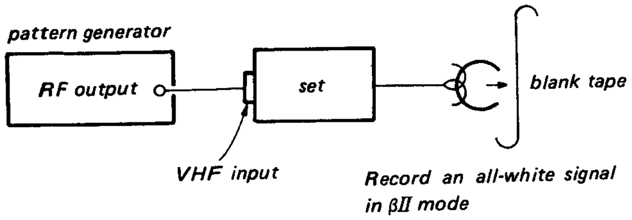

16.3kHz ± 100Hz

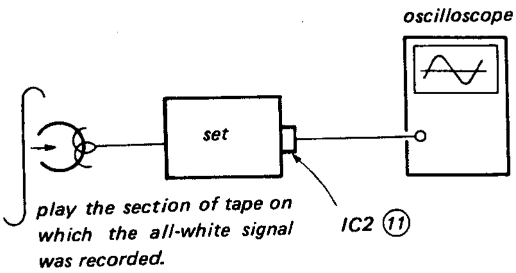
Fig. 5-18. Skew oscillation adjustment

8. AGC Adjustment (0.5H Correction Circuit) (YC-27 board)

Mode: Recording


pattern generator
RF output
set
blank tape
VHF input
Record an all-white signal in βII mode

Mode: Playback


oscilloscope
set
play the section of tape on which the all-white signal was recorded.
IC2 ⑪

[Method of adjustment]

1) Record an all-white signal in βII mode to produce a tape with all white recorded on it.
2) Play back the section of tape on which the all-white signal was recorded.
3) Adjust RV4 until the difference in levels of the amplitude shown in the diagram below, with and without a 1 MΩ resistor connected between the collector of Q9 (the 12V power supply line) and pin ⑩ of IC2 becomes minimum (0.02V or less).

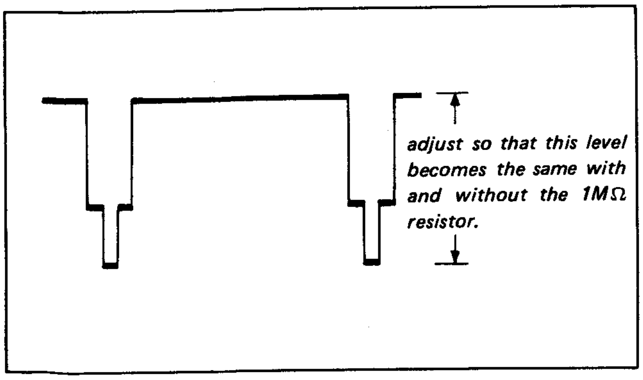

adjust so that this level becomes the same with and without the 1MΩ resistor.

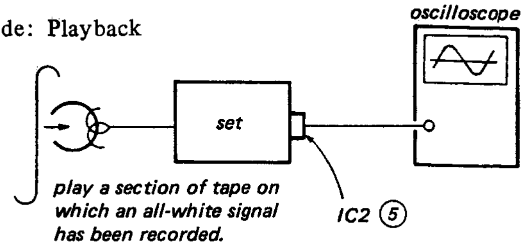
Fig. 5-19. AGC adjustment

9. Delay Level Adjustment (0.5H Correction Circuit) (YC-27 board)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 – 10 – 11 – 9 – 10 – 11.

Mode: Playback


oscilloscope
set
play a section of tape on which an all-white signal has been recorded.
IC2 ⑤

[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (the 12V power supply line) and pin ⑩ of IC2.
2) Connect pin ㉑ of IC2 to ground.
3) Play a section of tape on which an all-white signal has been recorded.
4) Measure the level both with and without a 51kΩ resistor connected between the emitter of Q9 (the 9V power supply line) and pin ⑳ of IC2.
5) Adjust RV6 so that the level measured without the 51kΩ resistor in the circuit is 125%, and 100% with the resistor in the circuit. A convenient way to do this is by adjusting the V knob on the oscilloscope so that the peak value at the V. SYNC position is 4 scale divisions; then with the resistor removed it should be 5 scale divisions. (See Fig. 5-20.)

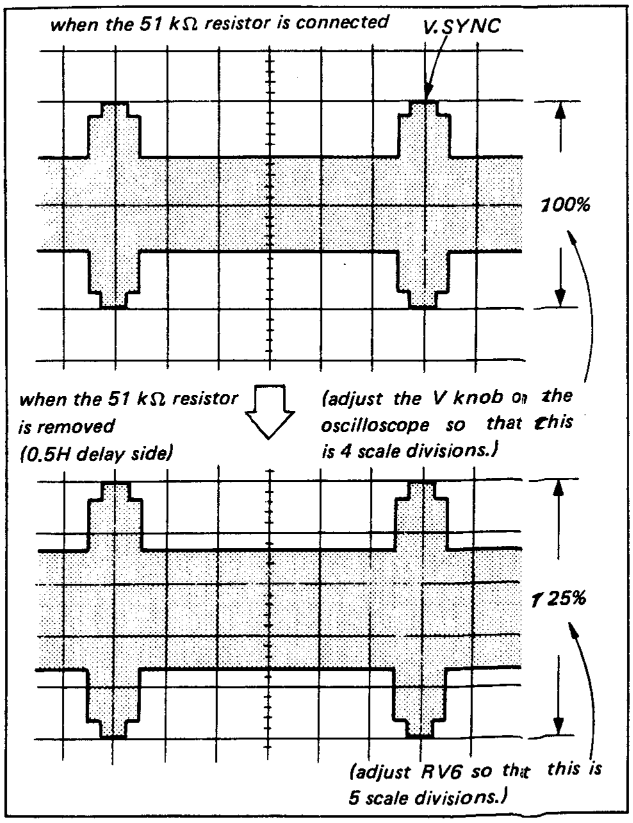

when the 51 kΩ resistor is connected
V.SYNC
100%
when the 51 kΩ resistor is removed (0.5H delay side)
(adjust the V knob on the oscilloscope so that this is 4 scale divisions.)
125%
(adjust RV6 so that this is 5 scale divisions.)

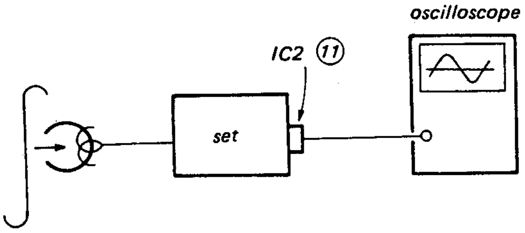
Fig. 5-20. Delay level adjustment

10. Delay Phase Adjustment (0.5$_H$ Correction Circuit) (YC-27 board)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

Mode: Playback



play a section of tape on which an all-white signal has been recorded.

[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (12V power supply line) and pin ⑩ of IC2.
2) Connect pin ㉑ of IC2 to ground.
3) Play a section of tape on which an all-white signal has been recorded.
4) Adjust LV1 so that the fuzziness due to the horizontal sync signal that appears in the central part of the waveform becomes minimum.

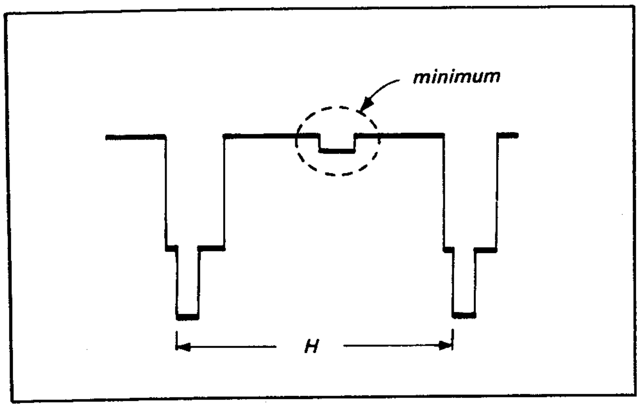


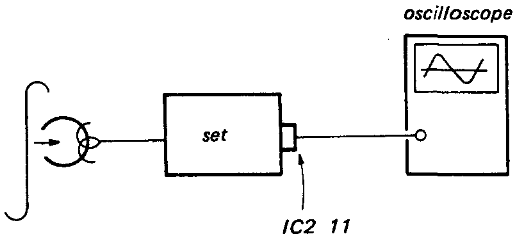
Fig. 5-21. Delay phase adjustment

11. Delay Color Signal Level Adjustment (0.5$_H$ Correction Circuit)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

Mode: Playback



alignment tape (KR5-1M)
βII color bar signal

[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (the 12V power supply line) and pin ⑩ of IC2. of IC2.
2) Connect pin ㉑ of IC2 to ground.
3) Play the βII color bar signal on the alignment tape.
4) Connect a 51 kΩ resistor between the emitter of Q9 (the 9V power supply line) and pin ⑳ of IC2, and measure the level of the color signal with and without this resistor in the circuit. Then adjust RV5 so that the difference between the two levels becomes minimum.

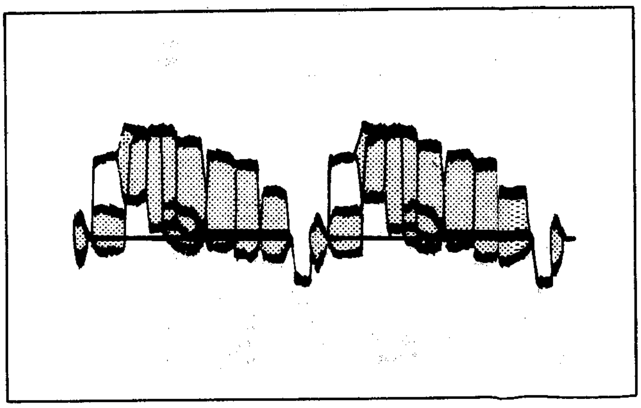
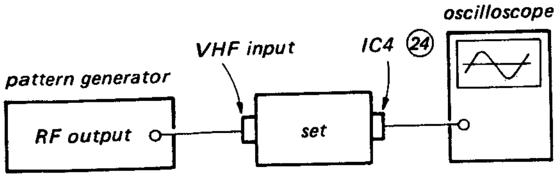


Fig. 5-22. Delay color signal level

5-4-2. Recording system

12. Peak AGC and Sync AGC Adjustments (YC-27 board)

Mode: E-E


oscilloscope
VHF input
IC4 ㉔
pattern generator
RF output
set

[Method of adjustment]

1) Supply a color bar signal with the chrominance signal removed (in other words a black-and-white signal) from the pattern generator.
2) Turn RV11 counterclockwise until the level is maximum.
3) Adjust RV2 (peak AGC) until the level becomes 1.06Vp-p ± 0.04Vp-p.
4) Adjust RV11 (sync AGC) until the level becomes 1.02Vp-p ± 0.04Vp-p. (See Fig. 5-23.)

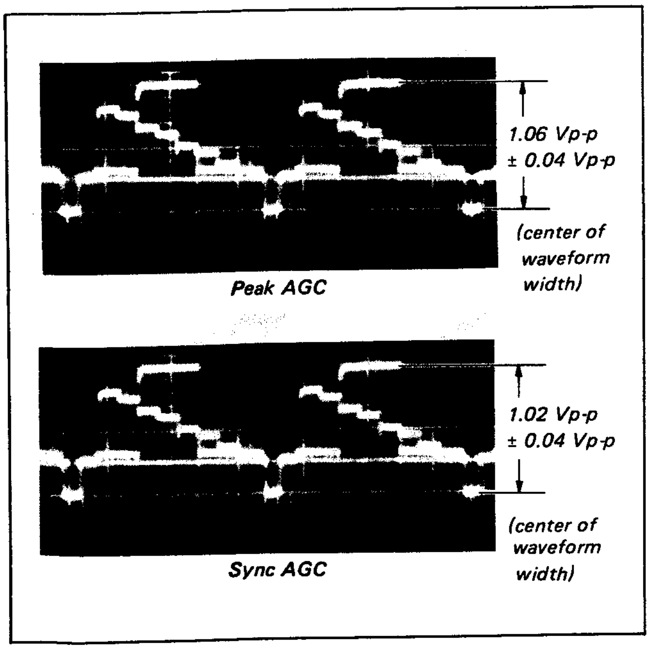
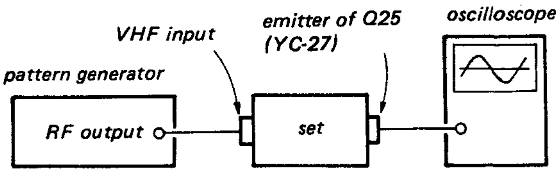


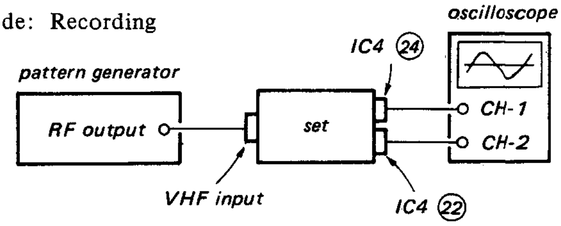
Fig. 5-23. Peak AGC and sync AGC adjustments

13. Comb Filter Adjustment (YC-27 board)

Mode: Recording


VHF input
emitter of Q25
(YC-27)
oscilloscope
pattern generator
RF output
set

Mode: Recording


oscilloscope
IC4 ㉔
pattern generator
RF output
set
CH-1
CH-2
VHF input
IC4 ㉒

[Method of adjustment]

1) Input a color bar signal and put the set in recording mode.
2) Connect the oscilloscope to the emitter of Q25 and then adjust LV2 and RV10 alternately until the chrominance signal is minimum. (See Fig. 5-24.)

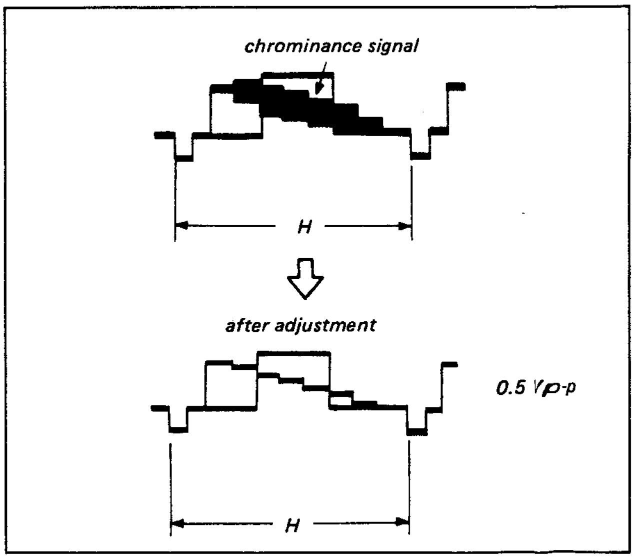

chrominance signal
H
after adjustment
0.5 Vp-p
H

Fig. 5-24. Comb filter adjustment

3) Adjust RV12 until the video signal levels at pin ㉔ of IC4 and pin ㉒ of IC4 are equal (video amplitude adjustment).

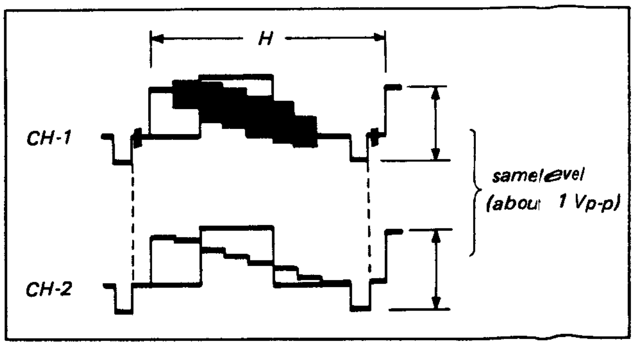
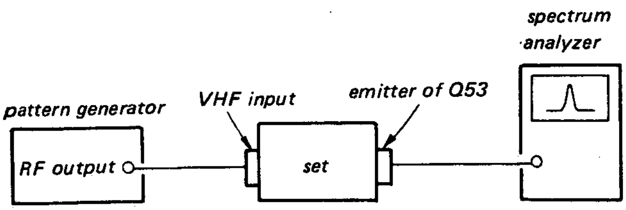

H
CH-1
same level
(about 1 Vp-p)
CH-2

Fig. 5-25. Comb filter adjustment

14. Sync Tip Carrier Frequency Setting and FM Deviation Adjustment (YC-27 board)

Mode: E-E


spectrum analyzer
pattern generator
VHF input
emitter of Q53
RF output
set

[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Observe the frequency distribution, and adjust RV17 and RV16 alternately until the sync tip carrier frequency and FM deviation fall within their respective specifications.

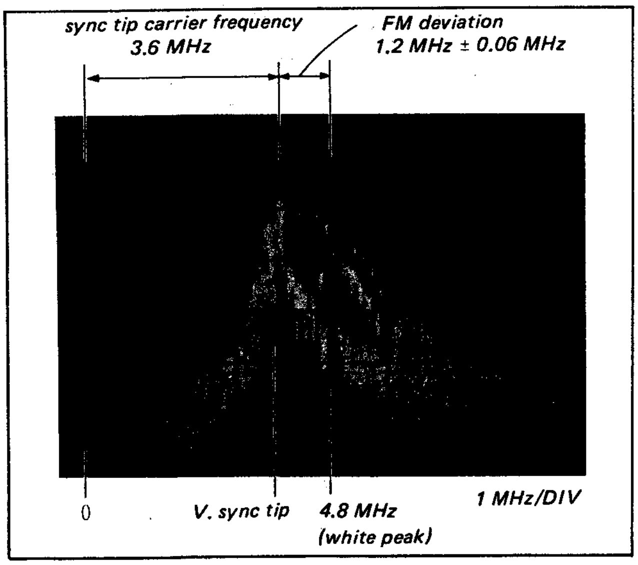
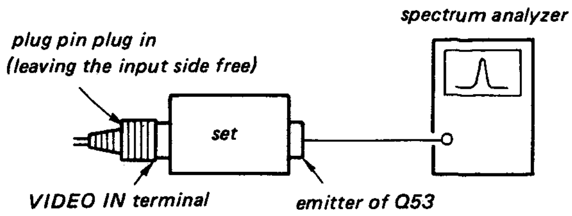


Fig. 5-26. Sync tip carrier frequency setting and FM deviation adjustment

15. 1/2 f_H Shift Adjustment (YC-27 board)

Mode: Recording


spectrum analyzer
plug pin plug in
(leaving the input side free)
set
VIDEO IN terminal
emitter of Q53

[Method of adjustment]

1) Plug a pin plug into the video input terminal (leaving the input side of the plug free),and put the set into recording mode without any signal input.
2) Adjust RV18 until the shift of the FM wave is 7.87 kHz ± 2 kHz. (See Fig. 5-27.)

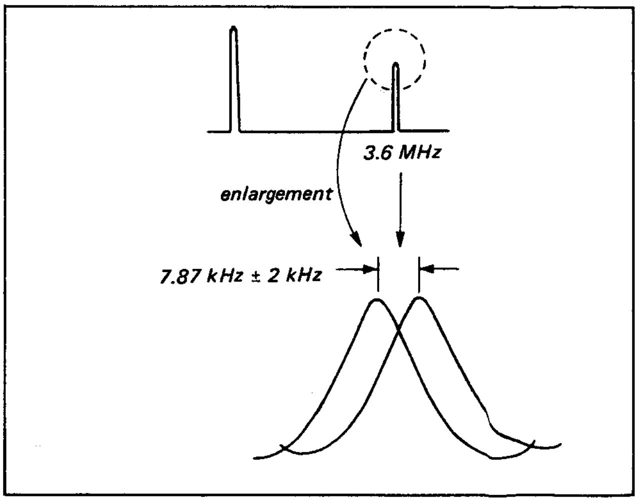
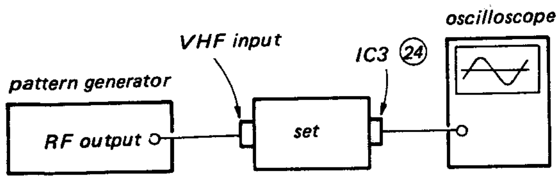

3.6 MHz
enlargement
7.87 kHz ± 2 kHz

Fig. 5-27. ½f_H shift adjustment

16. 4.27 MHz Balance Adjustment (YC-27 board)

Mode: E-E


oscilloscope
VHF input
IC3 ㉔
pattern generator
RF output
set

[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Adjust RV7 until the amplitude of the 4.27 MHz component is minimum. (See Fig. 5-28.)

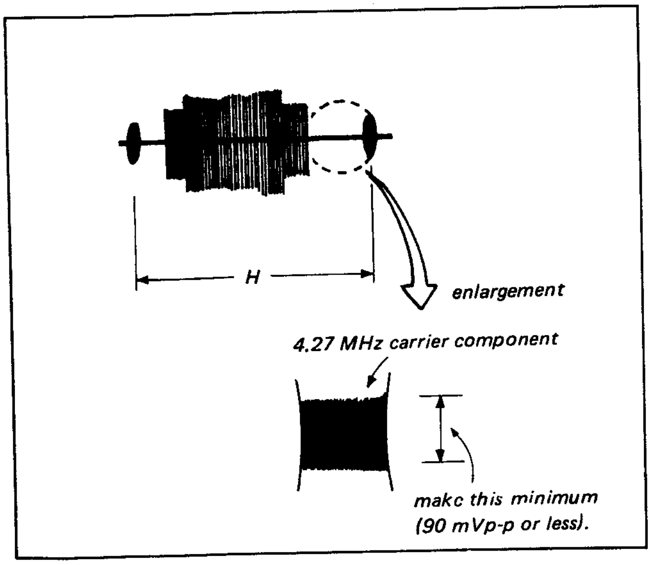
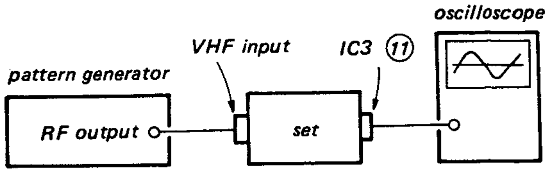

H
enlargement
4.27 MHz carrier component
make this minimum
(90 mVp-p or less).

Fig. 5-28. 4.27MHz balance adjustment

17. ACC Adjustment (YC-27 board)

Mode: E-E


oscilloscope
VHF input
IC3 ⑪
pattern generator
RF output
set

[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Adjust RV8 until the chrominance level is 0.85 Vp-p ± 0.05 Vp-p. (See Fig. 5-29.)

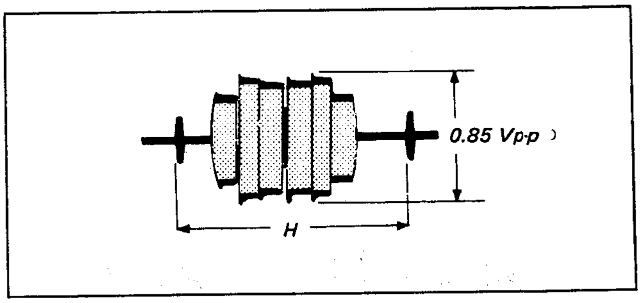
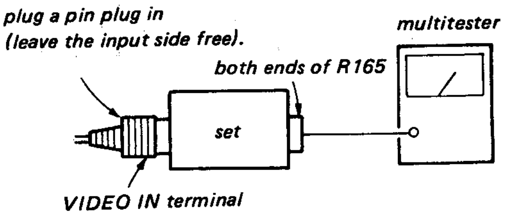


Fig. 5-29. ACC adjustment

18. White Clip Adjustment (YC-27 board)

Mode: E-E

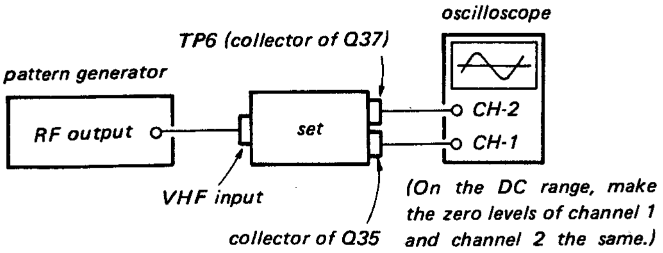

plug a pin plug in
(leave the input side free).
multitester
both ends of R165
set
VIDEO IN terminal

[Method of adjustment]

1) Plug a pin plug in to the video input terminal (leave the input side of the plug free), so that there is no signal input.
2) Adjust RV15 so that the voltage at both ends of R165 is 0.20V ± 0.05V.

19. Black Clip Adjustment (YC-27 board)

Mode: E-E


oscilloscope
TP6 (collector of Q37)
pattern generator
RF output
set
CH-2
CH-1
VHF input
collector of Q35
(On the DC range, make the zero levels of channel 1 and channel 2 the same.)

[Method of adjustment]

1) Put the oscilloscope on the DC range, and make zero levels of channel 1 and channel 2 equal to each other.
2) Supply a color bar signal, and put the set into E-E (direct picture) mode.
3) Adjust RV14 so that the potential at the tip of horizontal sync signal in the waveform on channel 2 equals the DC potential on channel 1 (the tip of the sync signal should be within ±50 mV). (See Fig. 5-30.)

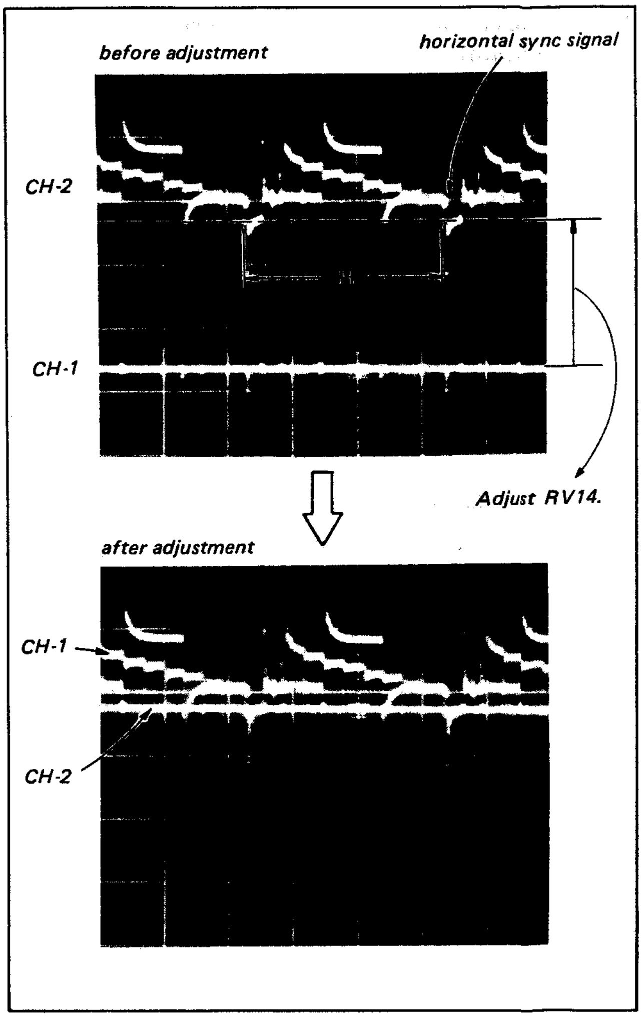
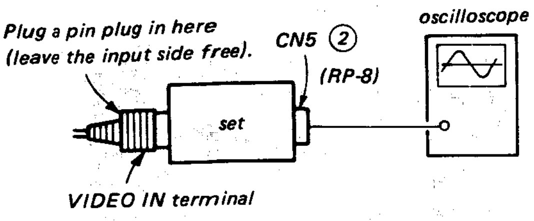

before adjustment
horizontal sync signal
CH-2
CH-1
Adjust RV14.
after adjustment
CH-1
CH-2

Fig. 5-30. Black clip adjustment

20. Luminance FM Recording Current Adjustment (RP-8 board)

Mode: Recording


Plug a pin plug in here
(leave the input side free).
CN5 ②
(RP-8)
oscilloscope
set
VIDEO IN terminal

[Method of adjustment]

1) Plug a pin plug in to the video input terminal (leaving the input side of the plug free) so that there is no input signal, and put the set into recording mode.
2) Adjust RV4 until the amplitude is 3.0Vp-p ± 0.1Vp-p. (See Fig. 5-31.)

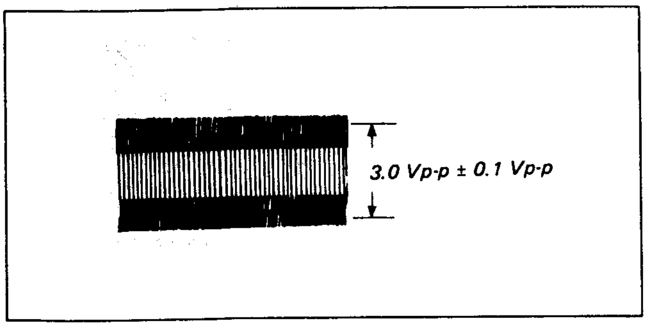
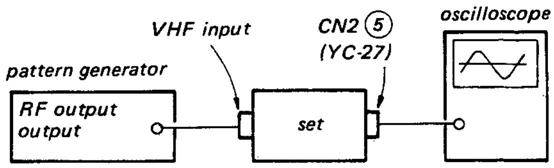

3.0 Vp-p ± 0.1 Vp-p

Fig. 5-31. Luminance FM recording current adjustment

21. Color Recording Current Adjustment (YC-27 board)

Mode: E-E


VHF input
CN2 ⑤
(YC-27)
oscilloscope
pattern generator
RF output
output
set

[Method of adjustment]

1) Supply a color bar signal and put the set in E-E (direct picture) mode.
2) Adjust RV13 until the amplitude is 230mVp-p ± 10mVp-p. (See Fig. 5-32.)

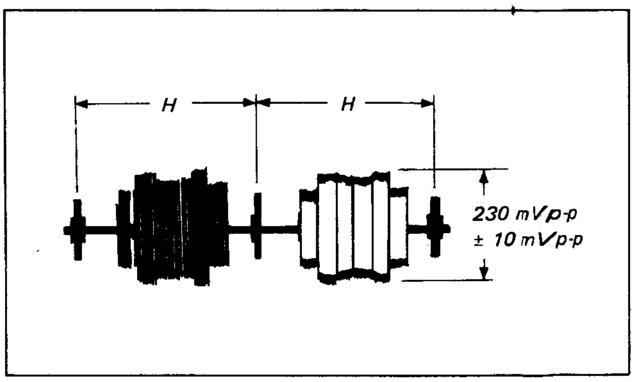

H
H
230 mVp-p
± 10 mVp-p

Fig. 5-32. Color recording current adjustment

5-5. AUDIO SYSTEM ADJUSTMENTS

Use a dynamicron tape to perform these adjustments.

Sequence of adjustments

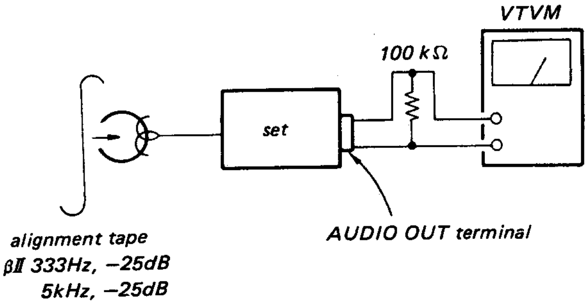
1. ACE head adjustment... refer to the description in mechanical section adjustments.
2. Playback frequency response adjustments
3. Playback output level adjustment
4. Bias trap adjustment
5. Sound recording bias adjustment
6. Sound recording level adjustment
7. Overall level check
8. Overall distortion rate check
9. Overall signal-to-noise ratio check

1. ACE Head Adjustment

Refer to the description in mechanical section adjustments.

2. Playback Frequency Response Adjustment (TA-16 board)

Mode: Playback

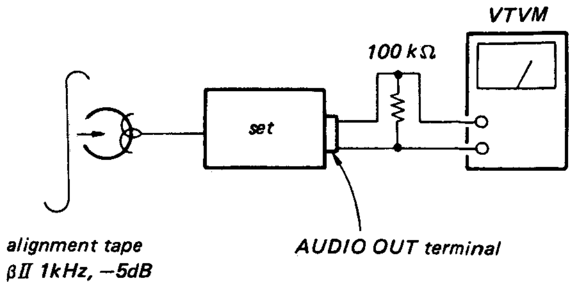

VTVM
100 kΩ
set
alignment tape
βII 333Hz, −25dB
5kHz, −25dB
AUDIO OUT terminal

[Method of adjustment]

1) Play the 333 Hz and 5 kHz βII audio signal sections on the alignment tape and measure the respective output levels.
2) Adjust RV502 so that the output level at 5 kHz is within 0 ± 1 dB of the output level at 333 Hz.

3. Playback Output Level Adjustment (TA-16 board)

Mode: Playback

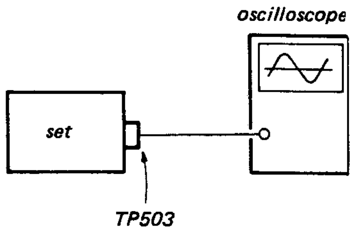

VTVM
100 kΩ
set
alignment tape
βII 1kHz, −5dB
AUDIO OUT terminal

[Method of adjustment]

1) Play the βII 1 kHz audio signal section on the alignment tape and measure the output level.
2) Adjust RV503 until the output level becomes −10dB (0.25V) $^{+4}_{-4}$dB.

4. Bias Trap Adjustment (TA-16 board)

Mode: Recording


oscilloscope
set
TP503

[Method of adjustment]

1) Put the set in recording mode with no signal input.
2) Adjust LV501 until the bias leak waveform is minimum, 1.2Vp-p or less. (See Fig. 5-33.)

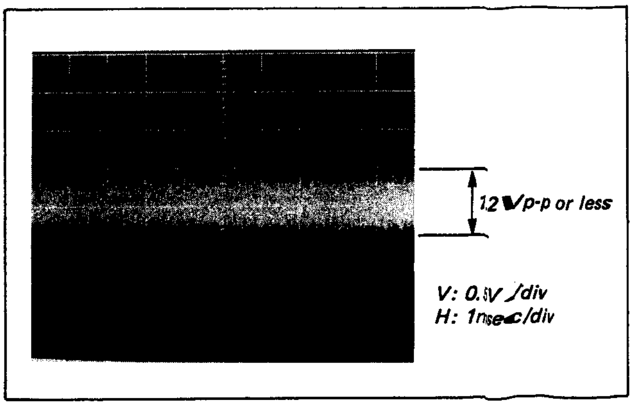
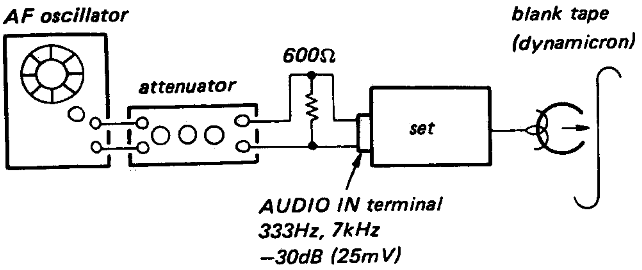

1.2Vp-p or less
V: 0.5V/div
H: 1msec/div

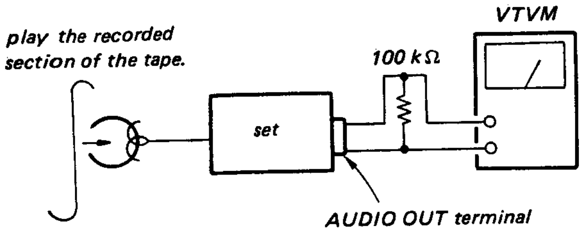
Fig. 5-33. Bias trap adjustment

5. Sound Recording Bias Adjustment (TA-16 board)

1. Mode: Recording (βIII mode)


AF oscillator
blank tape (dynamicron)
600Ω
attenuator
set
AUDIO IN terminal
333Hz, 7kHz
−30dB (25mV)

2. Mode: Playback

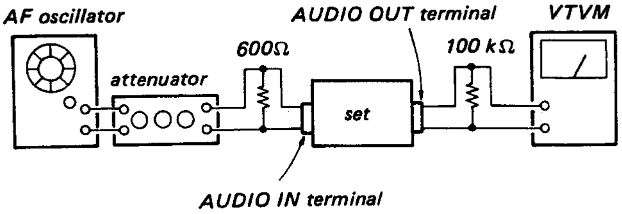

play the recorded section of the tape.
VTVM
100 kΩ
set
AUDIO OUT terminal

[Method of adjustment]

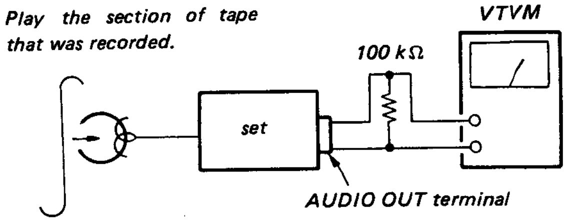
1) Short the two ends of R538 (TP506 and TP507) together to cut the AGC operation OFF.
2) Apply 333 Hz and 7 kHz, −30 dB (25 mV) signals to the audio input terminal and record them in βIII mode.
3) Play back the recorded section of tape and measure the respective output levels at 333 Hz and 7 kHz.
4) Confirm that the output level at 7 kHz is within ±1.5 dB of the output level at 333 Hz.
5) If the condition in step 4) is not satisfied, repeat steps 2) through 4). If the output level at 7 kHz is too high, turn RV501 clockwise. If the output level at 7 kHz is too low, turn RV501 counterclockwise.

6. Sound Recording Level Adjustment (TA-16 board)

1. Mode: Recording


AF oscillator
AUDIO OUT terminal
VTVM
600Ω
100 kΩ
attenuator
set
AUDIO IN terminal

2. Mode: Playback

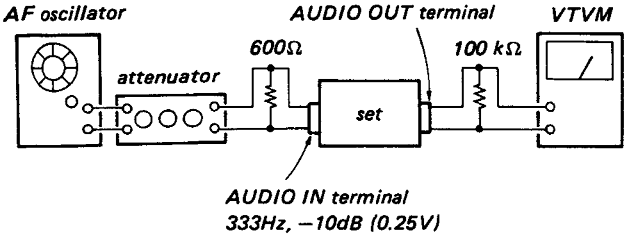

Play the section of tape that was recorded.
VTVM
100 kΩ
set
AUDIO OUT terminal

[Method of adjustment]

1) Short both ends of R538 (TP506 and TP507) together to cut the AGC OFF.
2) Input a 333 Hz signal, and adjust the attenuator so that the output level at the audio line output terminal in E-E mode becomes −10 dB (0.25V).
3) Record the 333 Hz signal.
4) Play the recorded section of tape back, and measure the level at the audio line output. It should be −10 dB (0.25V) ± 1 dB.
5) If the level measured in step 4) is outside of the correct range, repeat steps 2) through 4). If the output level is too high, turn RV504 clockwise. If the output level is too low, turn RV504 counterclockwise.

7. Overall Level Check

Mode: Recording/playback (βIII)


AF oscillator
AUDIO OUT terminal
VTVM
600Ω
100 kΩ
attenuator
set
AUDIO IN terminal
333Hz, −10dB (0.25V)

[Method of measurement]

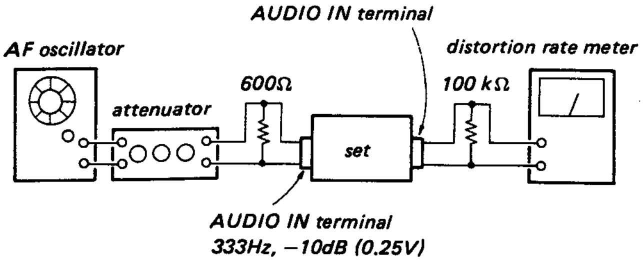
1) Apply a 333 Hz, −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Play the recorded section of tape back and measure the output level at the audio line output.
3) Confirm that the output level is −10dB (0.25V) $^{+4}_{-4}$ dB.

8. Overall Distortion Rate Check

[Condition]

Set the sound quality switch on high.

Mode: Recording/playback

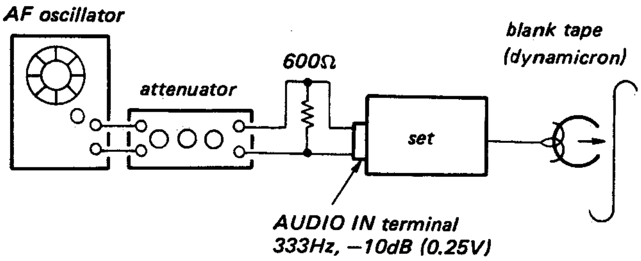

AUDIO IN terminal
AF oscillator
distortion rate meter
600Ω
100 kΩ
attenuator
set
AUDIO IN terminal
333Hz, −10dB (0.25V)

[Method of measurement]

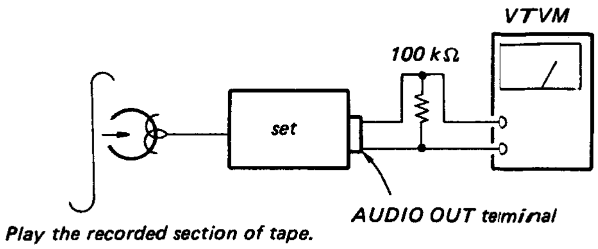
1) Apply a 333 Hz, −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Play the recorded section of tape back and measure the distortion rate at the audio line output terminal.
3) Confirm that the distortion rate is 4% or less.

9. Overall Signal-to-noise Ratio Check

1. Mode: Recording/playback


AF oscillator
blank tape
(dynamicron)
600Ω
attenuator
set
AUDIO IN terminal
333Hz, −10dB (0.25V)

2. Mode: Playback


VTVM
100 kΩ
set
AUDIO OUT terminal
Play the recorded section of tape.

[Method of adjustment]

1) Apply a 333 Hz −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Next, connect a pin plug to the audio input terminal, leaving the input side of the pin plug open. That is to say, the recording is now done with no input signal.
3) Play the sections of tape recorded in steps 1) and 2) back and measure the respective output levels.
   Confirm that the difference between the signal level obtained from the section recorded in step 1) and the noise level obtained from the section recorded in step 2) is 33 dB or more.

5-6. TUNER BLOCK SYSTEM ADJUSTMENTS

1. Tuner AGC Adjustment (TA-16 board)

Note:
The UHF adjustment locations are given in parentheses.

1) At maximum contrast, receive any TV broadcast signal.
2) Turn RV2 (RV1) clockwise until snow noise can be seen on the TV monitor screen.
3) Turn RV2 (RV1) counterclockwise slowly and adjust to the point where the snow noise just disappears.
4) Receive all of the channels and confirm that there is no beat due to cross-modulation, breakdown of the picture or snow noise.

2. AFT Adjustment (TA-16 board)

1) Receive any TV broadcast signal.
2) Turn the AFT switch OFF (with the preset cover removed).
3) Turn the preset potentiometer until a 920 kHz beat can be seen, then turn it counterclockwise slowly and leave it set at the point where the 920 kHz beat just disappears.
4) Turn the AFT switch ON (press the AFT switch lever).
5) Connect an oscilloscope to TP3 and adjust T004 so that the DC level becomes 5.0V. Confirm that there is no disappearance of color or 920 kHz beat.
6) Next, turn the AFT switch back OFF (with the preset cover removed) and turn the preset potentiometer until the picture quality just starts to deteriorate. Leave it set at that point.
7) Turn the AFT switch ON and OFF repeatedly to check the AFT operation.
8) Return the preset potentiometer to the position where it was set in step 3.